## SEQUENCE LISTING

<110> Kleanthous, Harold Al-Garawi, Amal Miller, Charles Tomb, Jean Francois Oomen, Raymond P.

<120> IDENTIFICATION OF POLYNUCLEOTIDES
 ENCODING NOVEL HELICOBACTER POLYPEPTIDES IN THE HELICOBACTER
 GENOME

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<141> 1997-06-24

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Asp Asn Ile Glu Lys Asp Leu Lys His Lys Ile Gln Ile Ile Thr Ala

caa acg cat aaa cgc ccc aaa cta gcc gtg att tta gtg ggg aaa gat 202 Gln Thr His Lys Arg Pro Lys Leu Ala Val Ile Leu Val Gly Lys Asp

ccc gct agt atc act tat gtc aat atg aag atc aaa gca tgc gaa agg
Pro Ala Ser Ile Thr Tyr Val Asn Met Lys Ile Lys Ala Cys Glu Arg
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gcc g Ala G															874
gtc t Val S															922
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Tyr	Gln	Ala	Ala 180	His	Thr	Lys	Pro	Leu 185	Lys	Thr	Phe	Ile	Leu 190	Phe	Ala
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		_	Ile	485					490					495	
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_				-			-		-		aca Thr		_			1400
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			agc Ser											19	76
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Phe Gly Met Met Leu Ser Asn Asn His Leu Arg Ala Ala Asn Asp Asn 1085 1075 1080 Asn Asn Asn Ile Pro Pro Arg Phe Ser Ser Thr Ser Ser Lys Asp 1100 1095 Asp Trp Ile Leu Ala Ala Ala Ala His Cys Leu Leu Pro Thr Glu Glu 1110 1115 Glu Ser Ala Ala Ser Ala Phe Phe Lys Arg Arg Arg Arg His Gly 1130 1135 1125 Asn Asn Ile Ile Lys Thr Val Val Arg Cys Phe Phe Val Lys Lys Gly 1140 1145 1150 Leu Leu Leu Leu Leu Ala Leu Leu Ser Tyr Gly Gly Glu Lys Lys 1155 1160 1165 Lys Asp Gln Gln Ala Phe Arg Arg Lys Ser Lys Lys Lys Pro Ile 1170 1175 1180 Leu Leu Gly Phe Glu Glu Ile His His Lys Leu Leu Gly Ile Glu Glu 1190 1195 Cys Arg Arg Arg Arg Phe His Gln Gln Thr Gly Gly Lys Gln 1205 1210 1215 Gln Leu Glu Phe Phe Leu Pro Pro Asn Phe Val Val Val Val Gly 1220 1225 1230 Gly Gly Glu Ser Ser Leu Ile Lys Lys Gly Ser Ser Leu Cys Cys 1235 1240 1245 Lys Thr Tyr Tyr Tyr Tyr Arg Thr Ser Ser Asp Lys Thr Thr Phe Trp 1250 1255 1260 Trp Ile Phe Gln Met Ile Ile Thr Ser Ser Ser Ser Leu Asn Gln 1270 1275 128 Gln Asn Ser Ser Ser Trp Leu Leu Ser Ala Gly Gly Ala Ala Leu Val 1285 1290 1295 Asn Asn Asn Asn Asn Ala Leu Leu His His His Thr Leu Val Val Glu 1305 1310 1300 Leu Leu His His Leu Ala Val Lys Lys Leu Asn Asp Asp Ile 1315 1320 Arg Arg Met Ala Asn Lys Ile Ile Glu Gln Gln Gln Gln Ser Leu 1330 1335 1340 Arg Arg Lys Asn Lys Ile Ile Cys Ala Leu Leu Gly Val Tyr Tyr 1345 1350 1355 Tyr Tyr Gln Gly Gly Arg Leu His His Cys Leu Asn Asn Leu Gln Gln 1370 1375 1365 Ile Glu Glu Asn Trp Ala Ala Ala Ala Trp Ala Leu Leu Gly Ser 1385 1380 Ser Gly Val Val Thr Ile Phe Phe Gln Arg Gly Gly Phe Gln Gln Gln 1400 Gln Gln Cys Gly Ile Ile Ile Phe Thr Asn Asn Gln Leu Val Val Val 1415 Thr Thr Gly Gly Gly Gly Gly Leu Asn Asn Cys Gly Gly Gly 1435 1425 1430 Ser Leu Leu Leu Phe Asn Asn Glu Lys Tyr Tyr Ser Ile Ser Ser Ser 1450 1455 1445 Ser Arg Ser Ile Ile Gly Lys Leu Leu Val Tyr Tyr Leu Lys Ile Ile 1465 Ser Asn Ile Ile Ile Arg Arg Arg Arg Leu Lys Arg Arg Leu Thr 1475 1480 1485 Thr Leu Thr Leu Leu Cys Ser Met Thr Thr Ser Val Gln Gln Gln 1495 Gln Gly Gln Gln Leu Arg Glu Glu Phe Ile Ile Met Gly Gly Glu Lys 1510 1515 Ser Ser Ile Leu Gln Gln Gln Gln Ala Arg Gln Gln Pro Thr Asn Asn 1530 Asn Thr Thr Lys Arg Met Met Asn Asn Phe Phe Phe Phe Phe Phe

,	1540		1545		155	0	
Phe Cys Asn 155	Leu Met Me 5	t Leu Val 156		Phe Lys	Ser Ser 1565	Tyr Lys	
Lys Thr Thr 1570	Ile Ile Il	e Ile Ile 1575	Thr Leu	Leu Phe 1580	-	Ala Thr	
Leu Leu Leu 1585	Lys Ala Ala 15		Asp Asp	Ile Thr 1595	Thr Thr	Thr Leu 160	
Leu Thr Thr	Asn Ser Ass 1605	n Asn Gln	Gly Gly 161		Ala Ala	Asn Leu 1615	
Asn Asn Gly	Ser Gly Se 1620	r Ser Ala	Arg Arg 1625	Glu Asn	Gly Gly 163		
Gly Gly Ala 163	Ile Ile Ly	s Ser Glu 164		Glu Glu	Ser Leu 1645	Leu Leu	
Ser Ser Thr 1650	Ile Lys Ly	s Asn Gln 1655	Gln Asp	Tyr Trp		Ala Ala	
Ala Ile Leu 1665	Arg Arg Me	_	Tyr Gln	Ser Ser 1675	Leu Ser	Ser Phe 168	
Asn Thr Thr	Thr Gln Gl: 1685	n Gln Gln	Gln Arg 169		Leu Arg	Leu Leu 1695	
Asn Ala Lys	Lys His Ala 1700	a Leu Leu	Val Met 1705	Met Asn	Gln Ile 171		
Ile Ile Arg 171	Gly Gly Gl	ı Leu Glu 172		Thr Ser	Ser Leu 1725	Tyr Tyr	
Pro His Leu 1730	Thr Ala Ala	a Ala Ala 1735	Asn Ala	Cys Cys 174		Gly Gly	
Phe Thr Thr 1745	Ala Met Th		Pro Val	Val Tyr 1755	Trp Gly	Ser Ser 176	
Trp Phe Lys	Asp Asp Se 1765	r Gly Ala	Ala Trp 177		Ser Ser	Ile Ile 1775	
Ile Ile Ile	Tyr Asp Asj 1780	o Ser Ser	Ser Ser 1785	Ala Ser	Leu Leu 179		
Pro Gly Tyr 179	Ser Ser Pro 5	o Leu Val 180		Val Trp	Ser Ile 1805	Ile Ile	
Lys Tyr Tyr 1810	Ser Arg Ar	g Val Leu 1815	Val Val	Asp Ala 1820		Ile Cys	
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	Asn Arg Al.						•
	atg ctc ag Met Leu Se						216
nys van ite	Met Led Se.	r veh við	25	var ite	ura per	30	

gtg atc cct aaa atc atc aag cct tta gaa tct tat aga gac ggc tcg Val Ile Pro Lys Ile Ile Lys Pro Leu Glu Ser Tyr Arg Asp Gly Ser 35 40 45	264
caa cat aaa att gaa cgc ccc aag gtt tgc cct ata tgt tcg cat gag Gln His Lys Ile Glu Arg Pro Lys Val Cys Pro Ile Cys Ser His Glu 50 55 60	312
ctt ttg tgc gaa gag att ttt act tat tgt caa aac ctt aat tgc ccg Leu Leu Cys Glu Glu Ile Phe Thr Tyr Cys Gln Asn Leu Asn Cys Pro 65 70 75	360
gca agg ttg aaa gaa agc ttg att cat ttc gct tct aaa gac gct tta Ala Arg Leu Lys Glu Ser Leu Ile His Phe Ala Ser Lys Asp Ala Leu 80 85 90 95	408
aac att caa ggc ttg ggc gat aaa gtc ata gag caa ctt ttt gaa gaa Asn Ile Gln Gly Leu Gly Asp Lys Val Ile Glu Gln Leu Phe Glu Glu 100 105 110	456
aag ctc att ttt aac gct ctg gat ttg tat gct tta aaa tta gaa gat Lys Leu Ile Phe Asn Ala Leu Asp Leu Tyr Ala Leu Lys Leu Glu Asp 115 120 125	504
tta atg cgg cta gac aaa ttt aaa att aaa aaa gct caa aat cta tta Leu Met Arg Leu Asp Lys Phe Lys Ile Lys Lys Ala Gln Asn Leu Leu 130 135 140	552
gac gct att tta aaa agc aaa aac cct ccc tta tgg cgt ttg att aac Asp Ala Ile Leu Lys Ser Lys Asn Pro Pro Leu Trp Arg Leu Ile Asn 145 150 155	600
gct tta ggg att gag cat att ggt aag gga gcg agt aaa acg ctg gcc Ala Leu Gly Ile Glu His Ile Gly Lys Gly Ala Ser Lys Thr Leu Ala 160 165 170 175	648
aaa tac ggc tta aat gtg tta gaa aaa agc gaa scg agt ttt Lys Tyr Gly Leu Asn Val Leu Glu Lys Ser Glu Xaa Ser Phe 180 185	690
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35 40 45 His Lys Ile Glu Arg Pro Lys Val Cys Pro Ile Cys Ser His Glu Leu	
50 55 60 Leu Cys Glu Glu Ile Phe Thr Tyr Cys Gln Asn Leu Asn Cys Pro Ala	

65 Arg	Leu	Lys	Glu	Ser 85	70 Leu	Ile	His	Phe	Ala 90	75 Ser	Lys	Asp	Ala	Leu 95	80 Asn	
Ile	Gln	Gly	Leu 100		Asp	Lys	Val	Ile 105		Gln	Leu	Phe	Glu 110		Lys	
Leu	Ile	Phe 115	Asn	Ala	Leu	Asp	Leu 120	Tyr	Ala	Leu	Lys	Leu 125	Glu	Asp	Leu	
Met	Arg 130		Asp	Lys	Phe	Lys 135		Lys	Lys	Ala	Gln 140		Leu	Leu	Asp	
Ala 145		Leu	Lys	Ser	Lys 150		Pro	Pro	Leu	Trp 155		Leu	Ile	Asn	Ala 160	
	Gly	Ile	Glu	His 165	Ile	Gly	Lys	Gly	Ala 170		Lys	Thr	Leu	Ala 175		
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					ttg Leu											104
					aga Arg			_	_	_			-		-	152
					cga Arg 40											200
					cgg Arg											248
					gtc Val											296
					cta Leu											344
aag Lys		taag	gttat	ta t	aaat	tttc	ca to	gcgaç	gaato	g gga	aatga	atat	ggg	gtgtt	tat	400
aat																403

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Trp Val Ala Ala Gly Ala Met Arg Pro Leu Ala Arg Ile Trp Leu Arg
                            40
Cys Met Lys Thr Arg Lys Met Arg Ile Gln Thr Ile Lys Lys Thr Leu
                        55
Cys Asn Cys Met Arg Trp Leu Val Lys Gly Gly Ile Cys Ser His Ala
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                                                                      104
Lys Lys Ile Val Val Asp Pro Ile Thr Arg Ile Glu Gly His Leu Arg
att gaa gtg atc gta gat gat gat aac gtg atc act gat gcg ttt tct
                                                                      152
Ile Glu Val Ile Val Asp Asp Asp Asn Val Ile Thr Asp Ala Phe Ser
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tct tct acg ctt ttt agg ggg cta gaa acc att att aaa ggc aga gat
                                                                      200
Ser Ser Thr Leu Phe Arg Gly Leu Glu Thr Ile Ile Lys Gly Arg Asp
35
cca cga gat gca ggc ttc atc gct caa agg att tgc ggg gta tgc act
                                                                      248
Pro Arg Asp Ala Gly Phe Ile Ala Gln Arg Ile Cys Gly Val Cys Thr
                 55
tat tcg cat tat aag gcc ggt atc acg gcg gta gaa aac gct cta ggc
                                                                      296
Tyr Ser His Tyr Lys Ala Gly Ile Thr Ala Val Glu Asn Ala Leu Gly
             70
atc act ccc cca tta aac gcg caa ttg gtg cga tct ttg atg aac atg
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Ile Thr Pro Pro Leu Asn Ala Gln Leu Val Arg Ser Leu Met Asn Met
         85
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	ctt Leu								392
	tgg Trp								440
	aaa Lys								488
	gaa Glu								536
	tct Ser 165								584
	tta Leu					-	_		632
	tta Leu								680
	aaa Lys								728
	atg Met								776
	gaa Glu 245								824
	atg Met								872
	ggc Gly								920
	aaa Lys								968
	tta Leu								1016
_	tgg Trp 325		_	_		_			1064

	gac Asp 340															1112
agc Ser 355	gtg Val	ggg Gly	att Ile	gaa Glu	aat Asn 360	aaa Lys	atc Ile	atc Ile	cct Pro	gct Ala 365	aaa Lys	gtg Val	ctt Leu	gac Asp	act Thr 370	1160
	aat Asn															1208
	gaa Glu															1256
	cct Pro															1304
	cct Pro 420															1352
_	att Ile	~	_		_		-	-				_			_	1400
	tta Leu															1448
	att Ile	_														1496
	agg Arg		_		_				-							1544
	aat Asn 500															1592
	tct Ser															1640
	atc Ile															1688
	ttt Phe															1736
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43

570 565 575

1837

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Lys Pro Met Glu Val Gly Pro Leu Ser Ser Val Val Val Gly Leu Ala

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395
385
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Ala Lys Asn Pro Tyr Val Thr Glu Val Ala Thr Lys Phe Leu Lys Asp
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                                    410
Thr Lys Leu Pro Leu Glu Ala Leu Phe Ser Thr Leu Gly Arg Thr Ala
                                425
                                                    430
Ala Arg Cys Ile Glu Ala Lys Thr Ile Ala Asp Asn Gly Leu Leu Ala
                            440
Phe Asp Ala Leu Val Glu Asn Leu Lys Ser Asp Gln Ser Thr Cys Ala
                                            460
                        455
Pro Tyr His Ile Asp Lys Asn Gln Glu Tyr Lys Gly Arg Tyr Ile Gly
                    470
                                        475
Gln Val Pro Arg Gly Met Leu Ser His Trp Val Arg Ile Lys Asn Gly
                485
                                    490
Val Val Glu Asn Tyr Gln Ala Val Val Pro Ser Thr Trp Asn Ala Gly
            500
                                                     510
                                505
Pro Arg Asp Ser Gln Asn Gln Arg Gly Ala Tyr Glu Met Ser Leu Ile
        515
                            520
                                                525
Gly Thr Lys Ile Ala Asp Leu Thr Gln Pro Leu Glu Ile Ile Arg Thr
                        535
                                            540
Ile His Ser Phe Asp Pro Cys Ile Ala Cys Ser Val His Val Met Asp
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Phe Lys Gly Gln Ser Leu Asn Glu Phe Lys Val Glu Pro Asn Phe Ala
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                     Met Ser Gln Lys Ile Leu Ile Leu Gly Ile Gly
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                                                                      160
Asn Ile Leu Phe Gly Asp Glu Gly Ile Gly Val His Leu Ala His Tyr
ctc aga aga agt ttt tct ttt ttc cct agc gtg ggt att ata ggt ggg
                                                                      208
Leu Lys Lys Asn Phe Ser Phe Phe Pro Ser Val Asp Ile Ile Asp Gly
         30
ggg aca atg gcc cag cag ctc att cct tta atc act tcg tat gaa aag
                                                                      256
Gly Thr Met Ala Gln Gln Leu Ile Pro Leu Ile Thr Ser Tyr Glu Lys
     45
gtt ttg att ttg gat tgc gtg agc gct gaa ggc gtt gag ata gga tca
                                                                      304
Val Leu Ile Leu Asp Cys Val Ser Ala Glu Gly Val Glu Ile Gly Ser
 60
qtc tat qct ttt gat ttt aag gac gct cct aaa gaa atc aca tgg gct
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Val Tyr Ala Phe Asp Phe Lys Asp Ala Pro Lys Glu Ile Thr Trp Ala
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70 75 Phe Lys Asp Ala Pro Lys Glu Ile Thr Trp Ala Gly Ser Ala His Glu 85 90 Val Glu Met Leu His Thr Leu Arg Leu Thr Glu Phe Leu Gly Asp Leu 105 110 Pro Lys Thr Phe Ile Val Gly Leu Val Pro Phe Val Ile Gly Ser Glu 120 Thr Thr Phe Lys Leu Ser Ser Lys Ile Leu Asn Ala Leu Glu Thr Ala 135 140 Leu Lys Ala Ile Glu Thr Gln Leu Asn Ala Trp Gly Val Lys Met Gln 150 155 Arg Thr Asp His Ile Ala Leu Glu Cys Ile Ala Glu Leu Ser Tyr Lys 165 Gly Phe

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ctg cct gtg tta tta atg ggg ctt gtt tgg agg ctt act cgc ccc ccc Leu Pro Val Leu Leu Met Gly Leu Val Trp Arg Leu Thr Arg Pro Pro 20 25 30	152
tta aag caa aat att oot aat aaa ago oto tot tta gaa aat tta aac Leu Lys Gln Asn Ile Pro Asn Lys Ser Leu Ser Leu Glu Asn Leu Asn 35 40 45 50	200
gaa caa atc aaa aac ctt aaa agc gta cca gct tta gaa aaa ctg aaa Glu Gln Ile Lys Asn Leu Lys Ser Val Pro Ala Leu Glu Lys Leu Lys 55 60 65	248
aac gac ttc aat gag cgt ttt aaa att tgc ccc aaa gat aaa gaa act Asn Asp Phe Asn Glu Arg Phe Lys Ile Cys Pro Lys Asp Lys Glu Thr 70 75 80	296
ctg tgg tta gaa acg atc caa aaa tta gtc gct tca gaa ttt ttt gaa Leu Trp Leu Glu Thr Ile Gln Lys Leu Val Ala Ser Glu Phe Phe Glu 85 90 95	344
tta gaa gac gct att aat ttt ggg caa gaa tta gaa aac gct aac cct Leu Glu Asp Ala Ile Asn Phe Gly Gln Glu Leu Glu Asn Ala Asn Pro 100 105 110	392
aat tac caa caa aaa atc gct aac gct acc ggc tta gcc ctt aag aatAsn Tyr Gln Gln Lys Ile Ala Asn Ala Thr Gly Leu Ala Leu Lys Asn115120130	440
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Pro	Pro	Leu 35	Lys	Gln	Asn	Ile	Pro 40	Asn	Lys	Ser	Leu	Ser 45	Leu	Glu	Asn	
Leu	Asn 50	Glu	Gln	Ile	Lys	Asn 55	Leu	Lys	Ser	Val	Pro 60	Ala	Leu	Glu	Lys	
Leu 65	Lys	Asn	Asp	Phe	Asn 70	Glu	Arg	Phe	Lys	Ile 75	Cys	Pro	Lys	Asp	Lys 80	
Glu	Thr	Leu	Trp	Leu 85	Glu	Thr	Ile	Gln	Lys 90	Leu	Val	Ala	Ser	Glu 95	Phe	
Phe	Glu	Leu	Glu 100	Asp	Ala	Ile	Asn	Phe 105	Gly	Gln	Glu	Leu	Glu 110	Asn	Ala	
Asn	Pro	Asn 115		Gln	Gln	Lys	Ile 120		Asn	Ala	Thr	Gly 125		Ala	Leu	
Lys	Asn 130		Lys	Glu	Lys	Gly 135										
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														1	Азр	
					tta Leu									1 gaa	ttg	104
Phe gtc	Leu agg	Glu 5 ctt	Lys tat	Val gat		Asp gat	Asn 10 tta	Gln tac	Val acg	Thr	Glu ggg	Ser 15 gaa	Lys gta	gaa Glu gcg	ttg Leu gat	104 152
Phe gtc Val cgc	agg Arg 20	Glu 5 ctt Leu cgc	Lys tat Tyr caa	Val gat Asp	Leu tat	Asp gat Asp 25 cac	Asn 10 tta Leu caa	Gln tac Tyr aaa	Val acg Thr	Thr cta Leu gtg	Glu ggg Gly 30 tat	Ser 15 gaa Glu ttt	Lys gta Val	gaa Glu gcg Ala	ttg Leu gat Asp	
Phe gtc Val cgc Arg 35	agg Arg 20 atg Met	Glu 5 ctt Leu cgc Arg	tat Tyr caa Gln aac	Val gat Asp aac Asn	tat Tyr atg	gat Asp 25 cac His	Asn 10 tta Leu caa Gln att	tac Tyr aaa Lys	acg Thr atc Ile	Thr cta Leu gtg Val 45 gac	ggg Gly 30 tat Tyr	Ser 15 gaa Glu ttt Phe	Lys gta Val aat Asn	gaa Glu gcg Ala gtc Val	ttg Leu gat Asp aat Asn 50	152
Phe gtc Val cgc Arg 35 agg Arg	agg Arg 20 atg Met cat His	Glu 5 ctt Leu cgc Arg tta Leu tca	tat Tyr caa Gln aac Asn	yal gat Asp aac Asn cct Pro 55 cac	tat Tyr atg Met 40	gat Asp 25 cac His aat Asn	Asn 10 tta Leu caa Gln att Ile	tac Tyr aaa Lys tgc Cys	acg Thr atc Ile gcg Ala 60	Thr cta Leu gtg Val 45 gac Asp	ggg Gly 30 tat Tyr gct Ala	Ser 15 gaa Glu ttt Phe tgc Cys	Lys gta Val aat Asn aaa Lys	gaa Glu gcg Ala gtc Val ttt Phe 65	ttg Leu gat Asp aat Asn 50 tgc Cys	152 200
gtc Val cgc Arg 35 agg Arg gct Ala	agg Arg 20 atg Met cat His ttt Phe gaa	Glu 5 ctt Leu cgc Arg tta Leu tca Ser atc	tat Tyr caa Gln aac Asn gcc Ala 70	yal gat Asp aac Asn cct Pro 55 cac His	tat Tyr atg Met 40 agc Ser	gat Asp 25 cac His aat Asn aaa Lys	Asn 10 tta Leu caa Gln att Ile aac Asn	tac Tyr aaa Lys tgc Cys cca Pro 75	acg Thr atc Ile gcg Ala 60 aac Asn	Thr cta Leu gtg Val 45 gac Asp cct Pro	ggg Gly 30 tat Tyr gct Ala tat Tyr	Ser 15 gaa Glu ttt Phe tgc Cys gaa Glu	gta Val aat Asn aaa Lys atg Met 80	gaa Glu gcg Ala gtc Val ttt Phe 65 agc Ser	ttg Leu gat Asp aat Asn 50 tgc Cys tta Leu	152 200 248

	tta Leu								440
	aag Lys								488
	aaa Lys								536
	tcc Ser								584
_	aaa Lys 180	-							632
	gct Ala								680
	Gl <sup>A</sup> aaa								728
	aaa Lys								776
	ttt Phe								824
	aat Asn 260								872
_	ata Ile	_						_	920
	gcg Ala								968
	aac Asn								1016
	ggc Gly								1064
	atc Ile								1112

350 345 340

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1160

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1183

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Leu Tyr Asn Phe Ile Gln Lys Phe

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360 355 <210> 25 <211> 616 <212> DNA <213> Helicobacter pylori <220> <221> CDS <222> (51)...(563) <400> 25 taatgagaat taaacgaaat tggatacaat cagcttaaaa aggatataaa gtg gaa 56 Val Glu aaa tta cct aaa aaa cga gtt tct aaa acc aaa tca caa aaa ctt atc 104 Lys Leu Pro Lys Lys Arg Val Ser Lys Thr Lys Ser Gln Lys Leu Ile 152 cat agc tta acc acc caa aaa aac aga gcc ttt ctc aaa aaa atc agc His Ser Leu Thr Thr Gln Lys Asn Arg Ala Phe Leu Lys Lys Ile Ser 200 gct aat gaa atg ctt tta gaa tta gaa aaa ggg gcg ttt aaa aaa aat Ala Asn Glu Met Leu Leu Glu Leu Glu Lys Gly Ala Phe Lys Lys Asn 40 248 qaa gct tat ttt att tct gat gaa gaa gat aaa aat tat gtt ttg gtg Glu Ala Tyr Phe Ile Ser Asp Glu Glu Asp Lys Asn Tyr Val Leu Val 296 cca gat aac gtg atc tct ctt ttg gca gaa aac gcc aga aag gct ttt Pro Asp Asn Val Ile Ser Leu Leu Ala Glu Asn Ala Arg Lys Ala Phe 344 gaa gcc agg ctt agg gcg gaa tta gaa agg gat att atc acc caa gcg Glu Ala Arg Leu Arg Ala Glu Leu Glu Arg Asp Ile Ile Thr Gln Ala 90 392 ccg att gat ttt gaa gac gtg cgc gaa gtt tcc ttg caa cta ttg gaa Pro Ile Asp Phe Glu Asp Val Arg Glu Val Ser Leu Gln Leu Leu Glu 110 105 aat tta cgc caa aaa gat ggg aat ttg cct aat atc aac acc tta aac 440 Asn Leu Arg Gln Lys Asp Gly Asn Leu Pro Asn Ile Asn Thr Leu Asn 125 115 488 ttt gtc aaa caa atc aaa aaa gaa cac cct aat tta ttc ttt aat ttt Phe Val Lys Gln Ile Lys Lys Glu His Pro Asn Leu Phe Phe Asn Phe 140 gac aac atg ttc aaa caa ccc cct ttt aat gag aat aat ttt gaa aat 536 Asp Asn Met Phe Lys Gln Pro Pro Phe Asn Glu Asn Asn Phe Glu Asn 155 583 ttt gac aat agc gat gag gaa aat ttt taatgcaaac cattgatttt Phe Asp Asn Ser Asp Glu Glu Asn Phe 165

56

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     <213> Helicobacter pylori
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Ile Ser Ala Asn Glu Met Leu Leu Glu Leu Glu Lys Gly Ala Phe Lys
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Lys Asn Glu Ala Tyr Phe Ile Ser Asp Glu Glu Asp Lys Asn Tyr Val
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                       55
Leu Val Pro Asp Asn Val Ile Ser Leu Leu Ala Glu Asn Ala Arg Lys
                                      75
                   70
Ala Phe Glu Ala Arg Leu Arg Ala Glu Leu Glu Arg Asp Ile Ile Thr
                                  90
               85
Gln Ala Pro Ile Asp Phe Glu Asp Val Arg Glu Val Ser Leu Gln Leu
                                                  110
                              105
Leu Glu Asn Leu Arg Gln Lys Asp Gly Asn Leu Pro Asn Ile Asn Thr
                           120
                                              125
Leu Asn Phe Val Lys Gln Ile Lys Lys Glu His Pro Asn Leu Phe Phe
                       135
                                          140
Asn Phe Asp Asn Met Phe Lys Gln Pro Pro Phe Asn Glu Asn Asn Phe
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Glu Asn Phe Asp Asn Ser Asp Glu Glu Asn Phe
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Glu Asn Ile Asn Glu Asn Ile Phe Glu Glu Val Gly Asp Ala Cys Val
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Ala	Gln	Asn	Lys	Leu 55	Gln	Leu	Asp	Thr	Asn 60	Leu	Lys	His	Leu	Leu 65	Glu	
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ccc Pro	ata Ile	gac Asp 85	acc Thr	tta Leu	ata Ile	gaa Glu	aaa Lys 90	gcc Ala	aga Arg	gaa Glu	aaa Lys	atc Ile 95	gct Ala	caa Gln	aag Lys	344
cat His	ggc Gly 100	atc Ile	gct Ala	tgg Trp	tat Tyr	aaa Lys 105	aaa Lys	tcc Ser	tat Tyr	ttt Phe	tcc Ser 110	ctt Leu	tta Leu	aaa Lys	aac Asn	392
cgc Arg 115	aaa Lys	aaa Lys	atg Met	gat Asp	agg Arg 120	gtg Val	ttt Phe	tca Ser	act Thr	gcg Ala 125	cat His	ttt Phe	tta Leu	gcc Ala	cct Pro 130	440
tgc Cys	gtt Val	ttc Phe	aag Lys	caa Gln 135	gta Val	GJÀ aaa	gat Asp	agt Ser	tta Leu 140	gag Glu	cct Pro	agg Arg	gcg Ala	gtg Val 145	ttt Phe	488
aaa Lys	ggt Gly	ttg Leu	ttc Phe 150	aaa Lys	cgc Arg	ttt Phe	aaa Lys	aaa Lys 155	agc Ser	gcg Ala	ctg Leu	cct Pro	cct Pro 160	tta Leu	aat Asn	536
caa Gln	aaa Lys	agt Ser 165	ttt Phe	tta Leu	caa Gln	aag Lys	cat His 170	gca Ala	gaa Glu	atg Met	aag Lys	ctt Leu 175	tta Leu	gaa Glu	aac Asn	584
ccc Pro	att Ile 180	caa Gln	aaa Lys	gtg Val	gcc Ala	att Ile 185	ttt Phe	ata Ile	ggg Gly	tgc Cys	ttg Leu 190	agc Ser	aat Asn	tac Tyr	cat His	632
tac Tyr 195	cag Gln	caa Gln	gtg Val	Gly	gaa Glu 200	agc Ser	ttg Leu	ttg Leu	tat Tyr	att Ile 205	tta Leu	gaa Glu	aaa Lys	ctc Leu	aac Asn 210	680
att Ile	caa Gln	gcg Ala	atc Ile	Ile	cct Pro	Lys	Gln	Glu	Cys	Cys	Ser	Ala	cct Pro	gcg Ala 225	Tyr	728
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gaa Glu	tgg Trp	ttt Phe 245	gaa Glu	agc Ser	tat Tyr	tta Leu	gat Asp 250	aaa Lys	gtg Val	gat Asp	gcg Ala	atc Ile 255	att Ile	gtg Val	cct Pro	824
gaa Glu	gcc Ala 260	aca Thr	tgc Cys	gct Ala	aca Thr	tgc Cys 265	tca Ser	tca Ser	acg Thr	att Ile	att Ile 270	aca Thr	agg Arg	tgt Cys	ttt Phe	872
	Ala								tga	agcg	ctt	ggaa	aaaa	tc		919

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His Lys Asp Glu Ala Thr Ser Pro Arg Gly Phe Leu Asp Leu Met Arg
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Leu Asn Ala Gln Asn Lys Leu Gln Leu Asp Thr Asn Leu Lys His Leu
                       55
Leu Glu Thr Cys Phe Leu Cys Thr Ala Cys Val Glu Ile Cys Pro Phe
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His Leu Pro Ile Asp Thr Leu Ile Glu Lys Ala Arg Glu Lys Ile Ala
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               85
Gln Lys His Gly Ile Ala Trp Tyr Lys Lys Ser Tyr Phe Ser Leu Leu
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                              105
           100
Lys Asn Arg Lys Lys Met Asp Arg Val Phe Ser Thr Ala His Phe Leu
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                                              125
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Ala Pro Cys Val Phe Lys Gln Val Gly Asp Ser Leu Glu Pro Arg Ala
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Val Phe Lys Gly Leu Phe Lys Arg Phe Lys Lys Ser Ala Leu Pro Pro
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Leu Asn Gln Lys Ser Phe Leu Gln Lys His Ala Glu Met Lys Leu Leu
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Glu Asn Pro Ile Gln Lys Val Ala Ile Phe Ile Gly Cys Leu Ser Asn
                              185
           180
Tyr His Tyr Gln Gln Val Gly Glu Ser Leu Leu Tyr Ile Leu Glu Lys
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                           200
Leu Asn Ile Gln Ala Ile Ile Pro Lys Gln Glu Cys Cys Ser Ala Pro
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                                          220
Ala Tyr Phe Thr Gly Asp Lys Asp Thr Thr Leu Phe Leu Val Lys Lys
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Asn Ile Glu Trp Phe Glu Ser Tyr Leu Asp Lys Val Asp Ala Ile Ile
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57

Met Lys Glu

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aca Thr 20	caa Gln	aat Asn	gcg Ala	cga Arg	tgg Trp 25	ata Ile	gat Asp	caa Gln	aaa Lys	tgc Cys 30	acc Thr	cct Pro	gat Asp	gtg Val	ttg Leu 35	153
tct Ser	ctt Leu	gtt Val	gct Ala	gat Asp 40	tgt Cys	att Ile	tta Leu	gag Glu	ttt Phe 45	acg Thr	caa Gln	tgt Cys	aat Asn	att Ile 50	gga Gly	201
aaa Lys	tca Ser	ttt Phe	tct Ser 55	att Ile	agg Arg	gat Asp	att Ile	tgg Trp 60	gat Asp	agc Ser	cct Pro	tac Tyr	acc Thr 65	aat Asn	gaa Glu	249
aat Asn	gtt Val	aaa Lys 70	atg Met	att Ile	ttt Phe	tct Ser	aaa Lys 75	cct Pro	gat Asp	tta Leu	aat Asn	tct Ser 80	gac Asp	ttt Phe	tcc Ser	297
atg Met	cat His 85	gaa Glu	tac Tyr	gat Asp	aag Lys	ttt Phe 90	ttt Phe	tct Ser	cag Gln	cct Pro	att Ile 95	aaa Lys	tta Leu	tta Leu	gcc Ala	345
tat Tyr 100	agc Ser	ggt Gly	att Ile	tta Leu	ttt Phe 105	gaa Glu	aca Thr	aaa Lys	act Thr	ggc Gly 110	aat Asn	aga Arg	aat Asn	att Ile	tat Tyr 115	393
acc Thr	ata Ile	caa Gln	aac Asn	ata Ile 120	gag Glu	cta Leu	tta Leu	gaa Glu	tat Tyr 125	ctc Leu	atg Met	caa Gln	aga Arg	gaa Glu 130	aca Thr	441
aac Asn	gct Ala	ttg Leu	aaa Lys 135	ttc Phe	ctt Leu	att Ile	tta Leu	tat Tyr 140	att Ile	caa Gln	aag Lys	gta Val	tta Leu 145	atg Met	gat Asp	489
agt Ser	Gly	att Ile 150	tat Tyr	cct Pro	tta Leu	ttt Phe	gac Asp 155	aac Asn	ttt Phe	tta Leu	caa Gln	aaa Lys 160	caa Gln	gac Asp	aca Thr	537
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aac Asn 180	aca Thr	gca Ala	atc Ile	aat Asn	aac Asn 185	gct Ala	acg Thr	gaa Glu	tgt Cys	ttt Phe 190	Arg	att Ile	ttt Phe	act Thr	aaa Lys 195	633
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Gly gaa	tat Tyr	ttg Leu	tcc Ser 215	Asn	act Thr	ata Ile	att Ile	aca Thr 220	aaa Lys	gat Asp	gag Glu	ctt Leu	aat Asn 225	Tyr	aat Asn	729
cgt Arg	atc Ile	aat Asn 230	Trp	cga Arg	gat Asp	ata Ile	gga Gly 235	Lys	gat Asp	aaa Lys	aat Asn	acc Thr 240	Thr	aga Arg	caa Gln	777

gaa Glu	tac Tyr 245	gat Asp	ctt Leu	ata Ile	aac Asn	tct Ser 250	aaa Lys	agg Arg	att Ile	gct Ala	aat Asn 255	tct Ser	aac Asn	tat Tyr	ctt Leu	825
att Ile 260	tca Ser	aaa Lys	gct Ala	aag Lys	aaa Lys 265	gtg Val	gtg Val	aaa Lys	cga Arg	tat Tyr 270	aat Asn	gat Asp	aga Arg	ttt Phe	aat Asn 275	873
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caa Gln	ata Ile	cac His	cat His 295	att Ile	ttt Phe	ccc Pro	atc Ile	caa Gln 300	gac Asp	ttt Phe	ccc Pro	att Ile	att Ile 305	gct Ala	aac Asn	969
tat Tyr	ata Ile	gag Glu 310	aat Asn	ctt Leu	atc Ile	gca Ala	ctc Leu 315	act Thr	cct Pro	aat Asn	caa Gln	cat His 320	ttt Phe	att Ile	tac Tyr	1017
gcc Ala	cac His 325	cct Pro	aat Asn	aat Asn	caa Gln	acc Thr 330	cgc Arg	ttg Leu	att Ile	gat Asp	aaa Lys 335	gat Asp	ttt Phe	caa Gln	tat Tyr	1065
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aca Thr	act Thr	atc Ile	ttt Phe 375	tct Ser	caa Gln	gtc Val	aag Lys	aac Asn 380	gaa Glu	tgg Trp	gaa Glu	tta Leu	tta Leu 385	aaa Lys	gta Val	1209
ata Ile	gat Asp	gct Ala 390	ttt Phe	tat Tyr	ttt Phe	gat Asp	ttt Phe 395	aac Asn	aag Lys	agc Ser	aaa Lys	gat Asp 400	cca Pro	agt Ser	tgg Trp	1257
tca Ser	tac Tyr 405	ttg Leu	cta Leu	gat Asp	aaa Lys	aac Asn 410	gat Asp	tta Leu	aga Arg	gct Ala	ttc Phe 415	aag Lys	cta Leu	aaa Lys	ttt Phe	1305
taa	taag	ttt	tatt	gaaa	ct g	gcta	taaa	a ac	ccgc	ttga	ctt	atct	tat	cctt	tt	1361
	<			icob	acte	r py	lori									
Met		400> Glu		Ser	Met	Ile	Asp	Phe	Leu	Lys	Leu	Arg	Asp	Tyr	Asp	
1	_			5					10				Cys	15	Pro	
			20					25					30		. Cys	

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Gln Asp Thr Glu Ser Phe Lys Gln Leu Lys Asp Gly Phe Thr His Phe
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Thr Ile Asn Asn Thr Ala Ile Asn Asn Ala Thr Glu Cys Phe Arg Ile
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Phe Thr Lys Ile Ile Asn Pro Leu Ala Phe Tyr Tyr Gly Lys Lys Gly
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Thr Arg Lys Gly Tyr Leu Ser Asn Thr Ile Ile Thr Lys Asp Glu Leu
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                                           220
Asn Tyr Asn Arg Ile Asn Trp Arg Asp Ile Gly Lys Asp Lys Asn Thr
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Asn Tyr Leu Ile Ser Lys Ala Lys Lys Val Val Lys Arg Tyr Asn Asp
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Arg Phe Asn Asn Ser Leu Ser Glu Val Lys Gln Glu Lys Glu Glu Ser
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Gln Ala Thr Gln Ile His His Ile Phe Pro Ile Gln Asp Phe Pro Ile
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Ile Ala Asn Tyr Ile Glu Asn Leu Ile Ala Leu Thr Pro Asn Gln His
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Phe Ile Tyr Ala His Pro Asn Asn Gln Thr Arg Leu Ile Asp Lys Asp
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Phe Gln Tyr Ile Cys Leu Leu Ala Lys Thr Thr Thr Ile Leu Asn Asp
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Gly Leu Lys Thr Thr Ile Phe Ser Gln Val Lys Asn Glu Trp Glu Leu
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Leu Lys Val Ile Asp Ala Phe Tyr Phe Asp Phe Asn Lys Ser Lys Asp
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Leu Lys Phe
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gcg att aga gat aca ggg cat ttt ttg gat tgc tct ttt gat att cat Ala Ile Arg Asp Thr Gly His Phe Leu Asp Cys Ser Phe Asp Ile His 20 25 30	154
gat agc gtg ggg gtt tta gat gag tat ttc gcg caa tca gag ttt ttt Asp Ser Val Gly Val Leu Asp Glu Tyr Phe Ala Gln Ser Glu Phe Phe 35 40 45 50	202
acg aat att gaa gat ttt gaa aag cat tta gag caa tct aag gat atg Thr Asn Ile Glu Asp Phe Glu Lys His Leu Glu Gln Ser Lys Asp Met 55 60 65	250
ggt aaa gaa atc aac tat ttg agt gtt tgc acg cct acg cac acg cat Gly Lys Glu Ile Asn Tyr Leu Ser Val Cys Thr Pro Thr His Thr His 70 75 80	298
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gaa aaa ccc tta gtt tta gac cct ggc gaa ata caa gaa ttg aaa gat Glu Lys Pro Leu Val Leu Asp Pro Gly Glu Ile Gln Glu Leu Lys Asp 100 105 110	394
tta gag gtg aaa cac caa aaa agg gtg ttt agt ctt tta ccc ttg cgc Leu Glu Val Lys His Gln Lys Arg Val Phe Ser Leu Leu Pro Leu Arg 115 120 125 130	442
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atc tat ttg ttt gga agc gtt aaa gac aag gtt atc aat aaa gaa gag Ile Tyr Leu Phe Gly Ser Val Lys Asp Lys Val Ile Asn Lys Glu Glu 195 200 205 210	682
cct gat tgc gta ggg gga tac tct ttt tagagcatgc caaaataaga Pro Asp Cys Val Gly Gly Tyr Ser Phe 215	729

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                                                 45
                            40
Phe Phe Thr Asn Ile Glu Asp Phe Glu Lys His Leu Glu Gln Ser Lys
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Asp Met Gly Lys Glu Ile Asn Tyr Leu Ser Val Cys Thr Pro Thr His
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Thr His Phe Asp His Ile Arg Phe Gly Leu Arg Asn Gly Met His Val
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Ile Cys Glu Lys Pro Leu Val Leu Asp Pro Gly Glu Ile Gln Glu Leu
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Lys Asp Leu Glu Val Lys His Gln Lys Arg Val Phe Ser Leu Leu Pro
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Leu Arg Leu His Cys Asp Thr Leu Ala Leu Lys Glu Lys Ile Lys Ser
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Ile Ser Val Gln Gly Lys Trp Tyr Phe Ser Ser Trp Arg Ala Asp Val
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Asn Arg Ser Gly Gly Leu Ala Thr Gln Met Gly Val Asn Ile Phe Asp
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Leu Leu Arg His Leu Thr Ser Ala Cys Val Phe Leu Ala Ser Lys Cys
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25

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gcc Ala	ctt Leu	att Ile	ttg Leu 70	gtg Val	ttg Leu	ggt Gly	cag Gln	gct Ala 75	ctg Leu	gct Ala	aac Asn	gct Ala	aaa Lys 80	tta Leu	gtc Val	296
													tat Tyr			344
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aaa Lys	acg Thr	atc Ile 245	gcg Ala	cat His	ttt Phe	ttg Leu	gaa Glu 250	aac Asn	agc Ser	gct Ala	ttg Leu	ctt Leu 255	tct Ser	tat Tyr	ctt Leu	824
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310

315

320

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325 330 335

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Ala Gln Met Leu Ser Leu Ala Phe Thr His Ile Ala Asn Glu Lys Thr
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Phe Val Leu Met Thr Phe Leu Ser Ala Gly Ile Val Asn Ile Phe Ile
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Pro Ser Gly Gly Gln Trp Ala Ile Gln Ala Pro Ile Met Leu Pro
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Ala Gly Gln Ser Leu Gly Val Asp Pro Gly Val Val Ser Met Ala Ile
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410
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420

425

430

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Leu Val Gln Lys Leu Leu Lys Tyr Leu Ala Ser Leu Pro Lys Gly Tyr
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Tyr Thr Ala Leu Trp Leu Val Thr Phe Leu Ser Leu Ile Ala Asn Trp
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Ile Asn Trp Gly Phe Gly Leu Val Ile Ser Ala Ile Phe Ala Lys Glu
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Pro Leu Ser Val Ala Thr Gln Asn Glu Asn Leu Ser Lys Ile Ser Ala
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Gly Val Ile Glu Lys Ala Ile Pro Ile Ser Gln Thr Ile Phe Ser Ser
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Tyr Asn Leu Ile Ile Ile Gly Ile Ile Leu Val Gly Leu Pro Phe Leu
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Met Ala Met Ile His Pro Lys Lys Glu Glu Ile Val Glu Ile Asp Ser
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Gln Asp Lys Thr Ile Ala His Phe Leu Glu Asn Ser Ala Leu Leu Ser
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Tyr Leu Leu Val Phe Leu Gly Phe Gly Tyr Leu Gly Val Tyr Phe Phe
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Lys Gly Gly Gly Ile Ser Leu Asn Ile Val Asn Thr Ile Phe Leu Phe
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Leu Gly Ile Leu Leu His Lys Thr Pro Leu Ala Tyr Val Lys Ala Ile
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Tyr Ala Gly Ile Met Gly Met Met Ala Ser His Ser Val Gly Gly His
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Ser Leu Ala Gln Met Leu Ser Leu Ala Phe Thr His Ile Ala Asn Glu
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Lys Thr Phe Val Leu Met Thr Phe Leu Ser Ala Gly Ile Val Asn Ile
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Phe Ile Pro Ser Gly Gly Gly Gln Trp Ala Ile Gln Ala Pro Ile Met
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Leu Pro Ala Gly Gln Ser Leu Gly Val Asp Pro Gly Val Val Ser Met
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Trp Met Val Val Ile Gly Ala Leu Ile Cys Met Leu Leu Gly Val Phe
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Ile Phe Phe Thr Ser Met Ser Val Lys Lys Phe Leu Ser Ala Tyr Leu
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                                                                      392
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                        105
                                             110
                                                                       440
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Gln Gln Lys Ile Ser Gln Ile Pro Leu Lys Asp Leu Asn Ala Leu Leu
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115
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                                                                       488
gaa aaa atg aaa ccc acg cgc ttg aat tgc tct tta aca ttc aac gct
Glu Lys Met Lys Pro Thr Arg Leu Asn Cys Ser Leu Thr Phe Asn Ala
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Ala Glu Asn Ile Leu Ala Tyr Thr Phe Phe Gln Glu Gly Leu Met Glu
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                             170
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Ala Gln Glu Asn Leu Ser Leu Lys Asn Ile Phe Lys Thr Leu Ser Ser
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180 185 190

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ttg g Leu G	raa Slu	gcc Ala	ttt Phe 230	tat Tyr	cac His	caa Gln	aat Asn	aaa Lys 235	gag Glu	agt Ser	ttg Leu	ggc Gly	ttt Phe 240	ttt Phe	tcc Ser	776
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                               265
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Ile Lys Thr His Ser Ser Asn Glu Lys Glu Arg Phe Val Arg Ile Glu
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His Gly Leu Ser Leu Met Ala Leu Ile Gly Val Leu Val Phe Gly Gly
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c L	tt eu	tta Leu	gaa Glu 85	gag Glu	caa Gln	caa Gln	atc Ile	cta Leu 90	aaa Lys	aac Asn	gaa Glu	tta Leu	gaa Glu 95	aaa Lys	gag Glu	cgt Arg	344
t P	tt he	aaa Lys 100	tac Tyr	tac Tyr	ata Ile	gaa Glu	aat Asn 105	agt Ser	gaa Glu	aat Asn	att Ile	ggc Gly 110	gat Asp	att Ile	gcg Ala	ttt Phe	392
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tagtcaagtc gctattactg caagcccggt gagcgcagcg gtnggtgttt atg agc Met Ser  1  ggc att tta gag cct tta gga gca aat tac ttg acc ctt tta atg gtt Gly Ile Leu Glu Pro Leu Gly Ala Asn Tyr Leu Thr Leu Leu Met Val  5  tgg atc cct acg act ttt tta gca tgc atg ctc acg gca ttt att atg Trp Ile Pro Thr Thr Phe Leu Ala Cys Met Leu Thr Ala Phe Ile Met	104
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ata Ile	gat Asp	gag Glu 165	atc Ile	aaa Lys	cga Arg	tac Tyr	gct Ala 170	tct Ser	ttt Phe	ttg Leu	atc Ile	gca Ala 175	gat Asp	tat Tyr	ccg Pro	584
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cta Leu	gga Gly	gcg Ala 245	Ile	gct Ala	atg Met	gat Asp	aac Asn 250	acc Thr	ggc Gly	acc Thr	act Thr	aaa Lys 255	Met	ggc	cgt Arg	824
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Lys Glu Thr Ser Lys Asn Ala Lys Leu Ser Leu Trp Ile Phe Ile Gly
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 Glu Asn Ser Ser Ile Trp Ser Asn Pro Ala Phe Val Ala Ile Ile Cys
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 Met Cys Val Leu Ser Leu Leu Arg Leu Asn Val Met Leu Ser Met Ile
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Val ( 1 Leu : Ser ( Val : 11e : 65 Asn . Ala : Arg	aaaat  22  22  22  24  Gly  Phe  Gly  Ile  50  Lys  Ala  Ala  Lys  Phe  130	210> 211> 212> 213> 400> Leu Val Phe 35 Phe Ala Leu Trp Lys 115 Phe	46 192 PRT Hel: 46 Val Ala 20 Pro Lys Lys Phe 100 Ala Lys	Thr 5 Phe Ser Glu Thr Leu 85 Asn Lys	Thr Phe Cys Leu Lys 70 Asn Ser Lys	Thr Ser Cys Val 55 Asn His Pro Thr Arg 135	Leu Ile Leu 40 Tyr Lys Asn Lys Phe	Ala Ile 25 Tyr Trp Asn Asn 105 Lys	Leu 10 Trp Ser Arg Lys Trp 90 Lys Val	Gly Arg Ser Arg Ser 75 Pro Glu Ile	Ile Ile Leu 60 Glu Cys Lys Lys	Ser Leu Thr 45 Ile Glu Lys Met	Cys Ala 30 Ser Ala Met Phe Lys 110 Pro	Ile 15 Leu Cys Ser Lys 95 Asn	Ile Ile Leu Ser His 80 Arg Pro	

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cct gtt aaa gat tct tta atg gtg ctt tat ctt ttc tat ttt gcg ctg Pro Val Lys Asp Ser Leu Met Val Leu Tyr Leu Phe Tyr Phe Ala Leu 100 105 110	393
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ctt ttt aca ctc gcg ctt att tta ttg ata ctg gtt tta atc tat tgc	585

Leu	Phe 165	Thr	Leu	Ala	Leu	Ile 170	Leu	Leu	Ile	Leu	Val 175	Leu	Ile	Tyr	Cys	
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	att Ile 245	taaa	agcto	caa a	atagg	gaata	ag ct	caaag	gcctt	ttg	gatto	gagt	gttt	tttt	tag	833
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			20					25					.3()			
	Phe		20 Asp	Asp	Phe	Ser	Gln 40	25 Leu			Leu	Phe 45	30 Glu	Asn	His	
His	Phe Tyr	35	Asp				40	Leu	Phe	Phe		45	Glu			
His Val Ser	Phe	35 Asp	Asp Phe	Ile	Val Leu	Lys 55	40 Leu	Leu Asp	Phe Tyr	Phe Leu	Gly 60	45 Leu	Glu Ile	Gly	Val	
His Val Ser 65	Phe Tyr 50 Leu	35 Asp Ile	Asp Phe Tyr	Ile Leu Ala	Val Leu 70	Lys 55 Val	40 Leu Leu	Leu Asp Ile	Phe Tyr Leu	Phe Leu Lys 75	Gly 60 Pro	45 Leu Phe	Glu Ile Thr	Gly Leu	Val Thr	
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His Val Ser 65 Arg	Phe Tyr 50 Leu Gln	35 Asp Ile Lys Phe	Asp Phe Tyr Cys Pro	Ile Leu Ala 85 Val	Val Leu 70 Cys Lys	Lys 55 Val Val	Leu Gly Ser	Leu Asp Ile Ile Leu 105 Trp	Phe Tyr Leu Leu 90 Met	Phe Leu Lys 75 Cys Val	Gly 60 Pro Leu Leu	45 Leu Phe Ser Tyr	Glu Ile Thr Phe Leu 110	Gly Leu Tyr 95 Phe	Val Thr 80 Ala Tyr	
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His Val Ser 65 Arg Trp Phe Lys Ala 145 Asp	Phe Tyr 50 Leu Gln Asn Ala Gln 130 Ser	35 Asp Ile Lys Phe Leu 115 Ser Ser	Asp Phe Tyr Cys Pro 100 Leu Phe Leu Leu	Ile Leu Ala 85 Val Ala Leu Gln Phe 165	Val Leu 70 Cys Lys Thr Pro Ser 150 Thr	Lys 55 Val Val Asp Leu Ser 135 Phe	Leu Gly Ser Leu 120 Met Arg	Leu Asp Ile Ile Leu 105 Trp Asn Phe Leu	Phe Tyr Leu 90 Met Arg Ile Leu 11e 170	Phe Leu Lys 75 Cys Val Phe Cys Ser 155 Leu	Gly 60 Pro Leu Leu 140 Val	45 Leu Phe Ser Tyr Gly 125 Val Ser Ile	Glu Ile Thr Phe Leu 110 Ala Trp Asp	Gly Leu Tyr 95 Phe Ser Val Cys Val 175	Thr 80 Ala Tyr Met Phe Val 160 Leu	
His Val Ser 65 Arg Trp Phe Lys Ala 145 Asp	Phe Tyr 50 Leu Gln Asn Ala Gln 130 Ser	35 Asp Ile Lys Phe Leu 115 Ser Ser	Asp Phe Tyr Cys Pro 100 Leu Phe Leu Lys	Ile Leu Ala 85 Val Ala Leu Gln Phe 165 Arg	Val Leu 70 Cys Lys Thr Pro Ser 150 Thr	Lys 55 Val Val Asp Leu Ser 135 Phe	Leu Gly Ser Leu 120 Met Arg	Leu Asp Ile Ile Leu 105 Trp Asn Phe Leu	Phe Tyr Leu 90 Met Arg Ile Leu 170 Tyr	Phe Leu Lys 75 Cys Val Phe Cys Ser 155 Leu	Gly 60 Pro Leu Leu 140 Val	45 Leu Phe Ser Tyr Gly 125 Val Ser Ile	Glu Ile Thr Phe Leu 110 Ala Trp Asp	Gly Leu Tyr 95 Phe Ser Val Cys Val 175 Thr	Val Thr 80 Ala Tyr Met Phe Val 160 Leu	
His Val Ser 65 Arg Trp Phe Lys Ala 145 Asp	Phe Tyr 50 Leu Gln Asn Ala Gln 130 Ser Phe	35 Asp Ile Lys Phe Leu 115 Ser Ser Ser	Asp Phe Tyr Cys Pro 100 Leu Phe Leu Lys 180	Ile Leu Ala 85 Val Ala Leu Gln Phe 165 Arg	Val Leu 70 Cys Lys Thr Pro Ser 150 Thr	Lys 55 Val Val Asp Leu Ser 135 Phe Leu	Leu Gly Ser Leu 120 Met Arg	Leu Asp Ile Ile Leu 105 Trp Asn Phe Leu 185 Val	Phe Tyr Leu 90 Met Arg Ile Leu 170 Tyr	Phe Leu Lys 75 Cys Val Phe Cys Ser 155 Leu Glu	Gly 60 Pro Leu Leu Ile 140 Val Leu	A5 Leu Phe Ser Tyr Gly 125 Val Ser Ile	Glu Ile Thr Phe Leu 110 Ala Trp Asp Leu Asn 190 Ser	Gly Leu Tyr 95 Phe Ser Val Cys Val 175 Thr	Thr 80 Ala Tyr Met Phe Val 160 Leu	

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aaa aaa ac Lys Lys Th 25	c tac ccc r Tyr Pro	tcc aaa Ser Lys 30	ctc aat Leu Asn	gag agt Glu Ser	ttt tta Phe Leu 35	ttc agg Phe Arg	cgt 211 Arg
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cat tcc ca His Ser Hi	t tct cta s Ser Leu 60	ggc att Gly Ile	gtc gct Val Ala	tat aag Tyr Lys 65	gaa gtt Glu Val	tta agc Leu Ser 70	gtg 307 Val
ctg gtt gt Leu Val Va	g gat aca 1 Asp Thr 75	aaa aac Lys Asn	gct ttt Ala Phe 80	Asp Lys	gaa agc Glu Ser	gct tct Ala Ser 85	tca 355 Ser
aac gcc ct Asn Ala Le 9	u Ser Gln	gcg cta Ala Leu	ggg tta Gly Leu 95	aag ggo Lys Gly	gaa gtg Glu Val 100	tta atc Leu Ile	ggc 403 Gly
aat aaa gc Asn Lys Al 105	a ctg cag a Leu Gln	ttt tat Phe Tyr 110	tat tcc Tyr Ser	aac cct Asn Pro	aaa aaa Lys Lys 115	gat ttt Asp Phe	ata 451 Ile
gat tta go Asp Leu Al 120	c gct ctt a Ala Leu	tgg tat Trp Tyr 125	gaa aaa Glu Lys	aaa cgo Lys Arg 130	, Leu Pro	ttt gtt Phe Val	ttt 499 Phe 135
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cgt ttt tagt Arg Phe	gattcg ctgagaat	gt aggcttaaaa	a ttcagaaagg	gtgtttt	aa 795
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Glu Ser Phe 35	Leu Phe Arg Arg	J Ile Asp Ala 40	Gly Phe Ile	Ser Ser	Ile
Ala Gly Tyr	Pro Phe Ala Lei			Ile Val	Ala
	Val Leu Ser Val	Leu Val Val		Asn Ala	Phe 80
65 Asp Lys Glu	Ser Ala Ser Ser	Asn Ala Leu 90		Leu Gly 95	
Lys Gly Glu	85 Val Leu Ile Gly 100		Leu Gln Phe		Ser
Asn Pro Lys	Lys Asp Phe Ile		Ala Leu Trp		Lys
Lys Arg Leu	Pro Phe Val Phe	e Gly Arg Leu	Cys Tyr Tyr	Gln Asn	Lys
Asp Phe Tyr	Lys Arg Leu Ser	Leu Ala Phe	Lys His Gln	Lys Thr	Lys 160
145 Ile Pro Tyr	150 Tyr Ile Leu Ly:		Leu Lys Thr	Asn Leu	
Arg Gln Asp	165 Ile Leu Asn Ty			175 Thr Leu	Gly
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            2.0
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Leu Leu Phe Leu Glu Ala Glu Asp Pro Glu Lys Asp Ile Gly Leu Tyr
                        55
Ile Asn Ser Pro Gly Gly Val Ile Thr Ser Gly Leu Ser Ile Tyr Asp
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Thr Met Asn Phe Ile Arg Pro Asp Val Ser Thr Ile Cys Ile Gly Gln
                                    90
Ala Ala Ser Met Gly Ala Phe Leu Leu Ser Cys Gly Ala Lys Gly Lys
                               105
                                                     110
Arg Phe Ser Leu Pro His Ser Arg Ile Met Ile His Gln Pro Leu Gly
                                                 125
                            120
Gly Ala Gln Gly Gln Ala Ser Asp Ile Glu Ile Ile Ser Asn Glu Ile
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Leu Arg Leu Lys Gly Leu Met Asn Ser Ile Leu Ala Gln Asn Ser Gly
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Gln Ser Leu Glu Gln Ile Ala Lys Asp Thr Asp Arg Asp Phe Tyr Met
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Lys Asn Val Lys
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Ala Phe Phe Leu Ser Val Tyr Leu Arg Ala Asp Asp Leu Val Thr Tyr
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acc atc atc aaa gaa aaa gat cta gga tac cag cgg ttt tta gcc aag
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Thr Ile Ile Lys Glu Lys Asp Leu Gly Tyr Gln Arg Phe Leu Ala Lys
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aag tgt tta agg ggt aaa acc cac cct ccg tgt ttt act aag cct aaa
                                                                       192
Lys Cys Leu Arg Gly Lys Thr His Pro Pro Cys Phe Thr Lys Pro Lys
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gaa Glu	aac Asn	cat His	tca Ser 100	aaa Lys	tac Tyr	cga Arg	gac Asp	att Ile 105	cct Pro	ttt Phe	gct Ala	gaa Glu	gtc Val 110	agt Ser	ttg Leu	336
att Ile	tat Tyr	ggc Gly 115	tat Tyr	aaa Lys	caa Gln	ttt Phe	ttt Phe 120	cct Pro	aaa Lys	aaa Lys	gag Glu	cgc Arg 125	tac Tyr	ggc Gly	ttc Phe	384
cgt Arg	ttt Phe 130	tat Tyr	gtc Val	tct Ser	ttg Leu	gat Asp 135	tac Tyr	gct Ala	tat Tyr	ggg	ttt Phe 140	ttt Phe	ctt Leu	aaa Lys	aat Asn	432
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agc Ser	tat Tyr	aga Arg	gaa Glu	aaa Lys 165	ttg Leu	caa Gln	aga Arg	aaa Lys	gag Glu 170	act Thr	ttt Phe	att Ile	aac Asn	gct Ala 175	att Ile	528
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ctg Leu	att Ile	tta Leu 195	Gly	atg Met	aat Asn	ttc Phe	gtg Val 200	gga Gly	gaa Glu	acc Thr	tgg Trp	ttt Phe 205	tat Tyr	gaa Glu	aca Thr	624
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agg Arg	tat Tyr	aag Lys	aat Asn	tgg Trp 245	gcg Ala	ata Ile	gaa Glu	ttg Leu	ggt Gly 250	Ala	cgc Arg	atc Ile	cct Pro	ttt Phe 255	tta Leu	768
acc Thr	aat Asn	gat Asp	tat Tyr 260	ttt Phe	aaa Lys	acc Thr	cct Pro	tta Leu 265	Tyr	acc Thr	ctt Leu	cat His	ttc Phe 270	aag Lys	cgc Arg	816
aat Asn	att Ile	tct Ser 275	Val	tat Tyr	ctc Leu	act Thr	tca Ser 280	Thr	tat Tyr	gac Asp	ttt Phe	tag	tttt	tta		862
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Lys Cys Leu Arg Gly Lys Thr His Pro Pro Cys Phe Thr Lys Pro Lys
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Lys Pro Lys Arg Lys Leu Phe Asn Ile Asp Lys Ser Ser His Tyr Tyr
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Gly Thr Ser Val Val Gln Met Ser Trp Leu Gln Ser Arg Glu Lys Phe
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Glu Asn His Ser Lys Tyr Arg Asp Ile Pro Phe Ala Glu Val Ser Leu
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Ile Tyr Gly Tyr Lys Gln Phe Phe Pro Lys Lys Glu Arg Tyr Gly Phe
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Arg Phe Tyr Val Ser Leu Asp Tyr Ala Tyr Gly Phe Phe Leu Lys Asn
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                        135
Lys Gly Val Leu Gly Asp Ser Leu Arg Glu Ser Ser Gln Ile Pro Lys
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                    150
Ser Tyr Arg Glu Lys Leu Gln Arg Lys Glu Thr Phe Ile Asn Ala Ile
                                                         175
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                                    170
Phe Tyr Gly Ala Gly Ala Asp Phe Leu Tyr Lys Arg Ala Phe Gly Thr
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                                185
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Arg Tyr Lys Asn Trp Ala Ile Glu Leu Gly Ala Arg Ile Pro Phe Leu
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Tyr Lys Asn Gly Glu Met Leu Ile Val Met Asp Asp Glu Asp Arg Glu
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15 20 25

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acc Thr	aaa Lys	gat Asp	tta Leu	gcg Ala 65	aaa Lys	aaa Lys	ttt Phe	gaa Glu	tta Leu 70	ccc Pro	cct Pro	atg Met	gtt Val	agc Ser 75	gtg Val	302
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aaa Lys	act Thr 190	ctc Leu	tat Tyr	gtc Val	tct Ser	gat Asp 195	ttg Leu	att Ile	agc Ser	tat Tyr	cgt Arg 200	ttg Leu	gaa Glu	aat Asn	gaa Glu	686
agt Ser 205	ttg Leu	ctg Leu	aaa Lys	atg Met	ttt Phe 210	tgt Cys	caa Gln	gaa Glu	gaa Glu	agg Arg 215	gaa Glu	ttt Phe	tta Leu	aaa Lys	cac His 220	734
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Lys	Gly	Ala	Lys	Thr 245		Asp	Leu	Ala	Pro 250		Val	Arg	Phe	His 255	Pro	
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		275					280	His				285				
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gac Asp 35	Ile	ttt Phe	aat Asn	aaa Lys	gcc Ala 40	atc Ile	aat Asn	caa Gln	aaa Lys	cga Arg 45	Ile	caa Gln	atg Met	gct Ala	ctt Leu 50	200
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                                25
Glu Lys Asp Ile Phe Asn Lys Ala Ile Asn Gln Lys Arg Ile Gln Met
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                            40
                                                45
Ala Leu Asn Leu Ile Phe Lys Leu Val Phe Ala Phe Val Ser Asn His
                        55
Phe Phe His Ala Phe Arg Arg Gln Asn Leu Tyr Asn Arg Val Phe Asn
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Arg Cys Val Phe Asn Leu Asp Phe Ile Gln Lys Leu Phe Ile Thr Gln
Phe
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                        Gly Glu Asn Ile Leu Phe His Lys Leu Ile
                                                                      159
tta aca tgc ttt tta gcg ctt gta gca ata acc att caa gct tgc ggt
Leu Thr Cys Phe Leu Ala Leu Val Ala Ile Thr Ile Gln Ala Cys Gly
                                                                      207
tat aaa gcc cct cca ttc aat gaa aaa ccc gct aaa aaa act tca aac
Tyr Lys Ala Pro Pro Phe Asn Glu Lys Pro Ala Lys Lys Thr Ser Asn
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                                                                      255
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Ser Ser Asn Ser Ser Met Gln Thr Pro Thr Asn Ser Thr Thr Pro Glu
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Phe Leu Asn Gln Pro
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Phe Leu Asn Asn Lys His Arg Glu Lys Gly Leu Lys Ala Glu Glu Glu
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                                                                      152
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Ala Cys Gly Phe Leu Lys Ser Leu Gly Phe Glu Met Val Glu Arg Asn
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Phe Phe Ser Gln Phe Gly Glu Ile Asp Ile Ile Ala Leu Lys Lys Gly
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                                                                       248
gtt ttg cat ttc att gaa gtc aaa agc ggg gaa aat ttt gat ccc att
Val Leu His Phe Ile Glu Val Lys Ser Gly Glu Asn Phe Asp Pro Ile
                                      60
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                                                                       296
Tyr Ala Ile Thr Pro Ser Lys Leu Lys Lys Met Ile Lys Thr Ile Arg
tgt tat ttg tcc caa aaa gat ccc aat agc gat ttt tgc ata gac gct
                                                                       344
Cys Tyr Leu Ser Gln Lys Asp Pro Asn Ser Asp Phe Cys Ile Asp Ala
                                                                       392
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Leu Ile Val Lys Asn Gly Lys Phe Glu Leu Leu Glu Asn Ile Thr Phe
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cgc Arg	aaa Lys 75	tac Tyr	ttc Phe	ccc Pro	cta Leu	gct Ala 80	ggc Gly	acg Thr	atc Ile	gct Ala	ttg Leu 85	tat Tyr	gtc Val	ttt Phe	ttt Phe	352
tct Ser 90	Asn	atg Met	ata Ile	ggc Gly	atc Ile 95	att Ile	cct Pro	ggc Gly	ttt Phe	gaa Glu 100	Ser	cct	acg Thr	gct Ala	agc Ser 105	400
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gca Ala	ggt Gly	cct Pro 140	gtg Val	aaa Lys	tgg Trp	ctc Leu	gcc Ala 145	cct Pro	ttc Phe	atg Met	ttc Phe	cct Pro 150	att Ile	gag Glu	atc Ile	544
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Gly	gct Ala	gtt Val 220	tta Leu	acc Thr	gat Asp	gaa Glu	ggg Gly 225	cat His	taag	gcaat	taa (	catto	cttg	tt		783
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gtt Val	tta Leu 20	ttg Leu	ctc Leu	gtg Val	agc Ser	ggt Gly 25	tct Ser	att Ile	gca Ala	gcg Ala	tat Tyr 30	aaa Lys	tcc Ser	cta Leu	gaa Glu	152
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tcc	: cct	ato	c act	caa	agt	aat	t tta	a aaa	cgc	ttg	g aaa	a gat	tco	aac	c cac	536

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					ctc Leu											210
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Phe	Tyr 50		Ser	Val	Asn	Glu 55		Asn	Glu	Lys	Ala 60		Leu	Asn	Cys	
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Lys 145		Leu	Asp	Ser	Leu 150		Val	Leu	Pro	Lys 155		Thr	Arg	Asp	Ala 160	
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tct ttc cgc cac Ser Phe Arg His 190		Phe Gly Ser		

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caa Gln	ggc Gly	gtt Val	aag Lys	cat His 225	ttg Leu	act Thr	aac Asn	gaa Glu	gaa Glu 230	gcc Ala	gca Ala	gaa Glu	gtt Val	agg Arg 235	aag Lys	902	
tat Tyr	gat Asp	ccg Pro	gat Asp 240	tcc Ser	aat Asn	caa Gln	agg Arg	gat Asp 245	tta Leu	ttc Phe	aat Asn	gcg Ala	atc Ile 250	gct Ala	aga Arg	950	J
Gly ggg	gat Asp	ttc Phe 255	cca Pro	aaa Lys	tgg Trp	aaa Lys	tta Leu 260	agc Ser	att Ile	caa Gln	gtg Val	atg Met 265	cca Pro	gaa Glu	gaa Glu	998	}
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tct Ser 365	Ser	agc Ser	aga Arg	gat Asp	ggt Gly 370	Tyr	atg Met	caa Gln	aac Asn	gga Gly 375	Tyr	tac Tyr	ggc	tct Ser	tta Leu 380	133	4
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430 435 440

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                                                                       107
Met Leu Thr Ile Glu Thr Ser Lys Lys Phe Asp Lys Asp Leu Lys Ile
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                                                                       155
ctt gtt aaa aac ggg ttt gat tta aag ctt ttg tat aaa gtg gtt gga
Leu Val Lys Asn Gly Phe Asp Leu Lys Leu Tyr Lys Val Val Gly
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             20
aat tta gcc aca gag caa ccc cta gct ccc aaa tac aaa gac cac cca
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Asn Leu Ala Thr Glu Gln Pro Leu Ala Pro Lys Tyr Lys Asp His Pro
                              40
         35
                                                                       251
ctc aaa ggc ggt tta aaa gat ttt agg gaa tgc cac tta aaa ccg gat
Leu Lys Gly Gly Leu Lys Asp Phe Arg Glu Cys His Leu Lys Pro Asp
     50
                          55
tta ttg ctt gtc tat caa att aaa aaa caa gaa aac acc ctc ttt tta
                                                                       299
Leu Leu Leu Val Tyr Gln Ile Lys Lys Gln Glu Asn Thr Leu Phe Leu
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 65
 gta agg tta ggc agt cat agc gag ctg ttt tgaaccgccc acacccctta
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Val Arg Leu Gly Ser His Ser Glu Leu Phe
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<213> Helicobacter pylori

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                            40
Leu Lys Gly Gly Leu Lys Asp Phe Arg Glu Cys His Leu Lys Pro Asp
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Leu Leu Val Tyr Gln Ile Lys Lys Gln Glu Asn Thr Leu Phe Leu
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                                                                       110
                    Val Leu Lys Leu Asn Leu Lys Lys Ser Phe Gln
                                                                       158
aaa gat ttt gat aaa ttg ctt ttg aat ggg ttt gat gat agc gtt ttg
Lys Asp Phe Asp Lys Leu Leu Leu Asn Gly Phe Asp Asp Ser Val Leu
              15
 aat gaa gtc att cta acc tta aga aaa aaa gaa ccg cta gat cca caa
                                                                       206
Asn Glu Val Ile Leu Thr Leu Arg Lys Lys Glu Pro Leu Asp Pro Gln
          30
 ttt caa gat cat gcc tta aag gga aag tgg aaa cct ttt agg gaa tgc
                                                                       254
 Phe Gln Asp His Ala Leu Lys Gly Lys Trp Lys Pro Phe Arg Glu Cys
                          50
      45
 cac att aag cct gat gtt ttg ctt gtg tat tta gtg aaa gat gat gaa
                                                                       302
 His Ile Lys Pro Asp Val Leu Leu Val Tyr Leu Val Lys Asp Asp Glu
                                          70
                      65
  60
                                                                       351
 ctg att ttg tta agg tta ggc agt cat agc gag ctg ttt taatccaccc
 Leu Ile Leu Leu Arg Leu Gly Ser His Ser Glu Leu Phe
                  80
                                       85
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                                                                       425
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Thr	Leu	Arg 35		Lys	Glu	Pro	Leu 40		Pro	Gln	Phe	Gln 45		His	Ala	
Leu	Lys 50	Gly	Lys	Trp	Lys	Pro 55	Phe	Arg	Glu	Cys	His 60	Ile	Lys	Pro	Asp	
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Leu	Gly	Ser	His	Ser 85	Glu	Leu	Phe									
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														gct Ala		164
														gcc Ala		212
														gag Glu		260
					Phe	His	Ser	Ala	Ile	Ser		Gln	Lys	gct Ala 65		308
														att Ile		356
														aat Asn		404
	-		_	_					-					aac Asn		452
		-	_				_		-		-	-		caa Gln	_	500

agt ttg gaa tat ttg aaa gcc a Ser Leu Glu Tyr Leu Lys Ala I 135	Met His Ser His Ile Leu Lys I	
gcc cct ttc gct gta ggg tta t Ala Pro Phe Ala Val Gly Leu 1 150		
cat ttt tta agc atg tct ctt t His Phe Leu Ser Met Ser Leu ( 165		
gat ctg att gaa agc gtg ttg ( Asp Leu Ile Glu Ser Val Leu ( 180 185		
tta gcc ttt caa agg ggt ttg g Leu Ala Phe Gln Arg Gly Leu (195 200		
aaa gtg gtt tta cca gag agc g Lys Val Val Leu Pro Glu Ser ( 215		agctgc 789
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<pre>&lt;213&gt; Helicobacter pylo</pre>	Pro Glu Asp Thr Glu Val Leu C 10 1 Ala Leu Thr Pro Arg Tyr Gln I 25 30	.5 .ys Val
<pre>&lt;213&gt; Helicobacter pylo</pre>	Pro Glu Asp Thr Glu Val Leu C 10 1 Ala Leu Thr Pro Arg Tyr Gln I 25 30 Gly Gly Cys Glu Ser Leu Glu G 45 Phe His Ser Ala Ile Ser Lys G	.5 Lys Val Glu Cys
<pre>&lt;213&gt; Helicobacter pylo</pre>	Pro Glu Asp Thr Glu Val Leu C 10 1 Ala Leu Thr Pro Arg Tyr Gln I 25 30 Gly Gly Cys Glu Ser Leu Glu G 45 Phe His Ser Ala Ile Ser Lys G 60 Ala Gln Glu Glu Leu Leu Phe G	.5 Dys Val Glu Cys Gln Lys Glu Thr
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<pre>&lt;213&gt; Helicobacter pylo</pre>	Pro Glu Asp Thr Glu Val Leu Con 10 10 10 10 10 10 10 10 10 10 10 10 10	.5 Lys Val Glu Cys Gln Lys Glu Thr 80 Val Ile 05 Lsp Leu Val Ala
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<pre> &lt;400&gt; 84  Met Gln Gly Leu Trp Ile Tyr I</pre>	Pro Glu Asp Thr Glu Val Leu G 10 10 30 Ala Leu Thr Pro Arg Tyr Gln I 25 30 Gly Gly Cys Glu Ser Leu Glu G 45 Phe His Ser Ala Ile Ser Lys G 60 Ala Gln Glu Glu Leu Leu Phe G 75 Leu Gln Ser Thr His Asp Phe N 90 Phe Phe Leu Asn Ala Pro Leu A 105 Leu Asn Ala Ser Val Val Ala N 120 Lys Ala Met His Ser His Ile I 140 Gly Leu Phe Ala Gly Glu Thr I 155 Ser Leu Cys Lys Gln Gln Cys G 170 Val Leu Gln Ile Lys Ser Glu I	Elu Cys Elu Cys Elu Thr 80 Fal Ile Esp Leu Fal Ala Leu Lys Leu 160 Elu Leu 175
<pre>     &lt;400&gt; 84  Met Gln Gly Leu Trp Ile Tyr I</pre>	Pro Glu Asp Thr Glu Val Leu Glu IO Ala Leu Thr Pro Arg Tyr Gln II 25 30 Gly Gly Cys Glu Ser Leu Glu Glu Glu Ala Gln Glu Glu Leu Leu Phe Glu Ala Gln Glu Glu Leu Leu Phe Glu Ala Gln Ser Thr His Asp Phe II 90 Phe Phe Leu Asn Ala Pro Leu Ala II 105 Leu Asn Ala Ser Val Val Ala II 125 Leu Asn Ala Gly Glu Thr II 155 Ser Leu Cys Lys Gln Gln Cys Gly I Leu Gln Ile Lys Ser Glu II 185 Gly Leu Glu Lys Lys Ala Lys II	LS Lys Val Glu Cys Glu Lys Glu Thr 80 Val Ile DS Leu Val Ala Leu Lys Leu Glu 160 Glu Leu .75 Le Ile
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220

215

tat att gat caa gca agc ccg gtg atg agc cct gat gaa ccc aat caa

Tyr Ile Asp Gln Ala Ser Pro Val Met Ser Pro Asp Glu Pro Asn Gln
190 195 200

gac aaa tac gca aga ggc atg gca gag cct ggc ttt aac gct aga ttt
Asp Lys Tyr Ala Arg Gly Met Ala Glu Pro Gly Phe Asn Ala Arg Phe
205 215

gaa att tcc tat aag ttt taataatgga tctaaaaaata aggatttcat
Glu Ile Ser Tyr Lys Phe
225

180

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185

821

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225

Phe

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														cat His	155
														att Ile	203
			_			-			-	_		-		ttt Phe	251
														ttg Leu	299
														aaa Lys 95	347
														aac Asn	395
		_		_									_	Gly aaa	443
														cct Pro	491
														ttt Phe	539
														gac Asp 175	587
											_			gcc Ala	635
														ttg Leu	683
														agc Ser	731

:	210					215					220					
ttt a Phe : 225																779
gtt g Val																827
aaa ( Lys :																875
ttt (																923
gaa ( Glu )																971
aaa Lys 305																1019
agt (																1067
gta ( Val (																1115
ttg ( Leu (	Gly															1163
gaa Glu		_					-			-	_		tgaa	aaaga	att	1212
	tcgg	gt t	gttg	ggtgg											tttgct gctctt	1272 1332 1350
	<2 <2	10> 11> 12> 13>	381 PRT	Lcoba	actei	r py-	lori									
Met 1		.00>		Phe	Met	Pro	Len	Len	His	Ala	Ͳህϒ	Asn	His	Ala	Ser	
1 Ile				5					10		-			15		
Val			20					25					30		_	
Val .		35					40					45				
,	- 9		<del>-</del>	4			<del>-</del>									

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               85
Ala Pro Leu Leu Glu Lys Asn Thr Ser Asn Phe Gln Glu Lys Asn Leu
                               105
           100
                                                   110
Lys Ile Leu Ser Leu Asn Tyr His His Asn Lys Ile Lys Leu Gly His
                           120
                                               125
Leu Lys Gly Asn Arg Phe Phe Met Arg Phe Lys Lys Met Thr Pro Leu
                       135
                                            140
Asn Ala Gln Lys Thr Lys Gln Val Leu Glu Gln Ile Ala Gln Phe Gly
                   150
                                        155
Met Pro Asn Tyr Phe Gly Ser Gln Arg Phe Gly Lys Phe Asn Asp Asn
               165
                                   170
                                                       175
His Gln Glu Gly Leu Lys Ile Leu Gln Asn Gln Thr Lys Phe Ala His
                               185
           180
                                                   190
Gln Lys Leu Asn Ala Phe Leu Ile Ser Ser Tyr Gln Ser Tyr Leu Phe
       195
                           200
                                                205
Asn Ala Leu Leu Ser Lys Arg Leu Glu Ile Ser Lys Ile Ile Ser Ala
                       215
                                           220
Phe Ser Val Lys Glu Asn Leu Glu Phe Phe Lys Gln Lys Asn Leu Ser
                    230
                                       235
Val Asp Ser Asp Thr Leu Lys Thr Leu Lys Asn Gln Ala His Pro Phe
               245
                                    250
Lys Ile Leu Glu Gly Asp Val Met Cys His Tyr Pro Tyr Gly Lys Phe
           260
                               265
Phe Asp Ala Leu Glu Leu Glu Lys Glu Gly Glu Arg Phe Leu Lys Lys
        275
                           280
                                                285
Glu Val Ala Pro Thr Gly Leu Leu Asp Gly Lys Lys Ala Leu Tyr Ala
                        295
                                            300
Lys Asn Leu Ser Leu Glu Ile Glu Lys Glu Phe Gln His Asn Leu Leu
                    310
                                       315
Ser Ser His Ala Lys Thr Leu Gly Ser Arg Arg Phe Phe Trp Val Phe
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                325
                                                        335
Val Glu Asn Val Thr Ser Gln Tyr Val Lys Glu Lys Ala Gln Phe Glu
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                               345
Leu Gly Phe Tyr Leu Pro Lys Gly Ser Tyr Ala Ser Ala Leu Leu Lys
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                                                                     111
                 Met Lys Leu Pro Val Val Glu Ser Phe Phe Ser Leu
caa ggt gaa gga aaa agg ata ggc aag ccc agt ctt ttt ttg cgc tta
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Gln Gly Glu Gly Lys Arg Ile Gly Lys Pro Ser Leu Phe Leu Arg Leu
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		15				20					25					
		_	ctt Leu		_	-				_				-	2	207
	-	-	cta Leu			-	-	-	_						2	255
			tct Ser 65												3	303
-	-		 gat Asp		_				_	-		_			3	351
		~ ~	 gag Glu		_	_									3	399
_	-		 cat His			-						_	_		4	147
_		~ ~	att Ile			-		_					_	-	4	195
			agc Ser 145	-									_	_	5	543
			ctt Leu												5	591
			aaa Lys												6	539
			caa Gln												6	587
			atg Met												7	735
			cta Leu 225												7	783
_	_		cat His		_	_		~							8	328

888

taaaaagtta atcatgacca tcaaagtttt ttcgcccaaa taccccactg aattagaaga

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gcctagtatt agcgggttcg ttcaaaaatt gcgcgagcat ggcggggaat tttttgaaat
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gagagaggt aacaagctca ttgggatttg tgggcttaat cctatcaatc aaacagaagc
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cgagctgtgc aa
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                                                    30
Leu Ser Cys Lys Gly Phe Asn Cys Lys Thr Leu Leu Asn Asp Glu Ile
                            40
Leu Thr Gly Cys Asp Ser Leu Tyr Ala Val His Pro Lys Phe Lys Thr
                        55
Ser Trp Asp Tyr Tyr Asn Glu Pro Lys Pro Leu Ile Glu Arg Leu Glu
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Asp Leu Ala Pro Asn Tyr Lys Asp Phe Asp Phe Ile Leu Thr Gly Gly
                85
                                    90
Glu Pro Ser Leu Tyr Phe Asn Asn Pro Ile Leu Ile Ser Val Leu Glu
            100
                                105
His Phe Tyr Arg Gln Lys Ile Pro Leu Cys Val Glu Ser Asn Gly Ser
        115
                            120
                                                125
Ile Phe Phe Glu Phe Ser Pro Ile Leu Lys Glu Leu His Phe Thr Leu
                        135
                                            140
Ser Val Lys Leu Ser Phe Ser Leu Glu Glu Glu Ser Lys Arg Ile His
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Leu Lys Ala Leu Gln Asn Ile Leu Asn Asn Ala Lys Ser Ala His Phe
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               165
Lys Phe Val Leu Glu Ser Gln Asn Ala Ala Gln Ser Ile Ile Glu Ile
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            180
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Gln Ser Leu Lys Gln Leu Ser Leu Lys Asn Asn Glu Ile Phe Leu
                            200
                                                205
Met Pro Leu Gly Thr Asn Asn Glu Leu Asp Lys Asn Leu Lys Thr
                        215
                                            220
Leu Ala Pro Leu Ala Ile Lys His Gly Phe Arg Leu Ser Asp Arg Leu
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His Ile Arg Leu Trp Asp Asn Gln Lys Gly Phe
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atg gtg gtt ttt act aaa aga gtc gca ctc tcg tta ttt gtg ggc att
                                                                      167
Met Val Val Phe Thr Lys Arg Val Ala Leu Ser Leu Phe Val Gly Ile
                                     10
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-				aaa Lys				_						26	3
				ttc Phe										31	1
				gtc Val 70										35	9
			-	aaa Lys										40	7
				gcc Ala										45	5
				cta Leu										50	3
				aca Thr										55	1
		-		tgc Cys 150	_		_				_			 59	9
				atg Met										64	7
			Leu	gtg Val	Gln	Ser		Ser	Ser		Tyr	Tyr	Ala	69	5
				gtc Val										74	3
				tat Tyr										79	1
-	-	_	_	tct Ser 230				_		_	_	_		83	9
				ttg Leu										88	7

	245	250	255
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		ctc atg ttg gat ggc Leu Met Leu Asp Gly 300	
	_	acg ctc gct tgg gct Thr Leu Ala Trp Ala 315	
		ggg ctt tac ttg gct Gly Leu Tyr Leu Ala 330	
	Asn Asn Gly Gly (	ggc gtg tat atg cct Gly Val Tyr Met Pro 345	
		ttt tct acc ggc aca Phe Ser Thr Gly Thr 365	
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	_	acg act ata cta tcg Thr Thr Ile Leu Ser 410	
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	_	tta atc ggt gtg gct Leu Ile Gly Val Ala 460	
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Asp Ile Ile Leu Ile Val Ser Ala Ile Leu Ser Gly Ala Val Tyr Gly

Asp His Thr Ser Pro Ile Ser A 405	410	415	
Ala Gly Cys Ser Val Gln Ser H 420	His Phe Ile Thr 425	Gln Leu Pro Tyr 430	Ala
Thr Ile Ala Met Leu Cys Ser A	Ala Val Ser Leu 140	Gly Val Ala Ser 445	Phe
Met Tyr Ser Arg Ser Leu Ala L		Val Ala Leu Leu 460	Val
450 455 Gly Val Phe Tyr Leu Leu Lys L 465 470	Lys Phe Tyr Gly 475		Thr 480
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gtt ata tct tta agg aaa gaa a Val Ile Ser Leu Arg Lys Glu A 15	aat ggg gtt agg Asn Gly Val Arg 20	aca cta ata agt Thr Leu Ile Ser 25	tta 159 Leu
ggg att ttg tta agc gtt ttg a Gly Ile Leu Leu Ser Val Leu S 30	agt ggc gat gat Ser Gly Asp Asp 35	ctg aag ttg tat Leu Lys Leu Tyr 40	tca 207 Ser
aaa ctt tca gtc tat tcg gct g Lys Leu Ser Val Tyr Ser Ala ( 45	gga agt ggg atg Gly Ser Gly Met 50	g att ggg att gat : Ile Gly Ile Asp 55	att 255 Ile
gac aaa cgg aca ttt tat aag o Asp Lys Arg Thr Phe Tyr Lys 2 60 65	cga gcg ttc gct Arg Ala Phe Ala	ttc acg atg aaa A Phe Thr Met Lys 70	tcg 303 Ser
ttg ttc ggt gaa aac ttg ctt f Leu Phe Gly Glu Asn Leu Leu 1 75 80	ttg ttt gtc aaa Leu Phe Val Lys 85	s Leu Lys His Ser	gcg 351 Ala 90
ttg acg agc aaa cac atg aaa Leu Thr Ser Lys His Met Lys 95	ggg cct tta gaa Gly Pro Leu Glu 100	a aac cgc cat cac 1 Asn Arg His His 105	His
tct ttc act aaa aat tat gaa Ser Phe Thr Lys Asn Tyr Glu 110	aaa gcg gtt aat Lys Ala Val Ası 115	t ggt tgt caa aag n Gly Cys Gln Lys 120	tat 447 Tyr
ttc cat att aaa ttg cct gaa Phe His Ile Lys Leu Pro Glu 125	ggc gct cct ago Gly Ala Pro Se: 130	c aac ttc aaa tca r Asn Phe Lys Ser 135	ggt 495 Gly
tca tac atg gcc act atg gtg	gtg cgt ttt ta	aagcgtta tttggggt	at 545

Ser	Tyr 140	Met	Ala	Thr	Met	Val 145	Val	Arg	Phe							
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a		100>		1	<b>-</b>	***	m1	7	7	77- T	T1.	Cox	Tou	7 20	Tazo	
1				5					10					Arg 15		
Glu	Asn	Gly	Val 20	Arg	Thr	Leu	Ile	Ser 25	Leu	Gly	Ile	Leu	Leu 30	Ser	Val	
Leu	Ser	Gly 35		Asp	Leu	Lys	Leu 40	Tyr	Ser	Lys	Leu	Ser 45	Val	Tyr	Ser	
Ala			Gly	Met	Ile	Gly 55		Asp	Ile	Asp	Lys 60		Thr	Phe	Tyr	
	50 Arg	Ala	Phe	Ala			Met	Lys	Ser			Gly	Glu	Asn	Leu 80	
65 Leu	Leu	Phe	Val		70 Leu	Lys	His	Ser		75 Leu	Thr	Ser	Lys	His		
Lys	Gly	Pro		85 Glu	Asn	Arg	His		90 His	Ser	Phe	Thr		95 Asn	Tyr	
Glu	Lys	Ala	100 Val	Asn	Gly	Cys		105 Lys	Tyr	Phe	His		110 Lys	Leu	Pro	
Glu	Gly	115 Ala	Pro	Ser	Asn	Phe	120 Lys	Ser	Gly	Ser	Tyr	125 Met	Ala	Thr	Met	
Val 145	130 Val	Arg	Phe			135					140					
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tct Ser	atc Ile	gct Ala	aaa Lys 10	agt Ser	tcg Ser	cct Pro	tta Leu	gag Glu 15	tta Leu	gtg Val	aaa Lys	atc Ile	tat Tyr 20	caa Gln	aag Lys	163
caa Gln	tgc Cys	agg Arg 25	caa Gln	ttt Phe	gat Asp	tgc Cys	gag Glu 30	Leu	gaa Glu	ttg Leu	gtg Val	gat Asp 35	tta Leu	ttc Phe	cct Pro	211
aaa Lys	aat Asn 40	Thr	gcc Ala	aac Asn	gct Ala	caa Gln 45	Lys	gtt Val	tct Ser	aaa Lys	aaa Lys 50	Leu	gct Ala	caa Gln	aaa Lys	259

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					aaa Lys											355
aaa Lys	atg Met	tta Leu	gaa Glu 90	aat Asn	cat His	ctt Leu	aat Asn	att Ile 95	aat Asn	ttt Phe	ttt Phe	atc Ile	gct Ala 100	gga Gly	gcg Ala	403
tat Tyr	Gly ggg	ttt Phe 105	gaa Glu	gaa Glu	aat Asn	ttt Phe	tta Leu 110	aag Lys	gat Asp	tgt Cys	caa Gln	gct Ala 115	tgg Trp	agt Ser	ttg Leu	451
agc Ser	gag Glu 120	atg Met	act Thr	ttt Phe	agc Ser	cat His 125	gaa Glu	gtg Val	gct Ala	aaa Lys	att Ile 130	gtc Val	tta Leu	tgc Cys	gag Glu	499
					tta Leu 140											547
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Val	Lys	Ile		Gln	Lys	Gln.	Cira									
Leu	Val				_	0111	Cys		Gln	Phe	Asp	Cys		Leu	Glu	
Lys			20 Leu	Phe	Pro		Asn	25				Gln	30			
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Asn	50	35 Leu	Leu	Gln	Pro	Lys Ser 55	Asn 40 Tyr	25 Thr Ser	Ala Leu	Asn Ala Pro	Ala Phe 60	Gln 45 Glu	30 Lys Pro	Val Tyr	Ser Leu Gly	
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65 Asp Phe Cys	50 Pro Ser Phe Gln	35 Leu Lys Phe Ile Ala 115	Ala Ala Ala Ala Ala Trp	Gln Lys Phe 85 Gly Ser	Pro Lys Asn 70 Ser Ala Leu	Lys Ser 55 Ile Lys Tyr Ser	Asn 40 Tyr Ala Met Gly Glu 120	25 Thr Ser Leu Leu Phe 105 Met	Ala Leu His Glu 90 Glu Thr	Asn Ala Pro 75 Asn Glu Phe	Ala Phe 60 Lys His Asn Ser	Gln 45 Glu Ala Leu Phe His 125	30 Lys Pro Gln Asn Leu 110 Glu	Val Tyr Arg Ile 95 Lys Val	Ser Leu Gly 80 Asn Asp Ala	
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65 Asp Phe Cys	50 Pro Ser Phe Gln Ile	115 Val	Leu Ala Ala Ala 100 Trp Leu	Gln Lys Phe 85 Gly Ser Cys	Pro Lys Asn 70 Ser Ala Leu Glu	Lys Ser 55 Ile Lys Tyr Ser Gln	Asn 40 Tyr Ala Met Gly Glu 120	25 Thr Ser Leu Leu Phe 105 Met	Ala Leu His Glu 90 Glu Thr	Asn Ala Pro 75 Asn Glu Phe	Ala Phe 60 Lys His Asn Ser Leu	Gln 45 Glu Ala Leu Phe His 125	30 Lys Pro Gln Asn Leu 110 Glu	Val Tyr Arg Ile 95 Lys Val	Ser Leu Gly 80 Asn Asp Ala	

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agt aag gaa gaa cag cca agc cat tgg gtg aaa tgc cct aaa tgt tat Ser Lys Glu Glu Gln Pro Ser His Trp Val Lys Cys Pro Lys Cys Tyr 20 25 30 35	214
gcg tta atg tat cat aaa gaa gtg ttt agt aaa tac agc gtg tgt ttg Ala Leu Met Tyr His Lys Glu Val Phe Ser Lys Tyr Ser Val Cys Leu 40 45 50	262
aaa tgc cat tac cat ttc cgc atg aaa gcg gct gaa agg att gaa ttt Lys Cys His Tyr His Phe Arg Met Lys Ala Ala Glu Arg Ile Glu Phe 55 60 65	310
tta tgc gat gtg ggg agt ttt gaa gag ttt gac aag cat tta cgg cct Leu Cys Asp Val Gly Ser Phe Glu Glu Phe Asp Lys His Leu Arg Pro 70 75 80	358
aat gat cct tta aat ttc gtg gat aaa gag agc tat aaa caa cgc att Asn Asp Pro Leu Asn Phe Val Asp Lys Glu Ser Tyr Lys Gln Arg Ile 85 90 95	406
aaa aaa tac gaa aaa agg act aac cgc cca agc tca gtg atc agc ggt Lys Lys Tyr Glu Lys Arg Thr Asn Arg Pro Ser Ser Val Ile Ser Gly 100 105 110 115	454
gag gct aaa atc aac cgc atg cct ttg cag atc gtg gtg ttt gat ttt Glu Ala Lys Ile Asn Arg Met Pro Leu Gln Ile Val Val Phe Asp Phe 120 125 130	502
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aga gca atc aat cgc gcg gtc gct aaa aga gaa gcg tta ttg att gtt Arg Ala Ile Asn Arg Ala Val Ala Lys Arg Glu Ala Leu Leu Ile Val 150 155 160	598
tca gcg agt ggg ggt agg atg caa gaa tcc act tat tcg ctc atg Ser Ala Ser Gly Gly Ala Arg Met Gln Glu Ser Thr Tyr Ser Leu Met 165 170 175	646
caa atg gct aaa acg agc gcg gct ttg aac cga ttg agt gag gcc aaa Gln Met Ala Lys Thr Ser Ala Ala Leu Asn Arg Leu Ser Glu Ala Lys 180 185 190 195	694
ctc cct ttc att tcg ctc tta agc gat ccc act tat ggg ggc gtt agc	742

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Āla	Ser	Phe	Ala 215	Phe	Leu	Gly	Asp	Leu 220	Ile	Ile	Ala	Glu	Pro 225	Gly	Ala	
atg Met	ata Ile	ggc Gly 230	ttt Phe	gcg Ala	Gly ggg	cct Pro	agg Arg 235	gtg Val	att Ile	aag Lys	caa Gln	act Thr 240	ata Ile	Gly ggg	gcg Ala	838
gat Asp	ttg Leu 245	cct Pro	gag Glu	ggc Gly	ttt Phe	caa Gln 250	aca Thr	gcg Ala	gaa Glu	ttt Phe	tta Leu 255	tta Leu	gag Glu	cat His	ggc ggc	886
ttg Leu 260	att Ile	gat Asp	atg Met	att Ile	gtg Val 265	cac His	agg Arg	aag Lys	gat Asp	ttg Leu 270	aag Lys	aag Lys	act Thr	ttg Leu	agc Ser 275	934
gat Asp	ctc Leu	atc Ile	gct Ala	atg Met 280	atg Met	acg Thr	cat His	aag Lys	act Thr 285	tca Ser	aag Lys	att Ile	ttt Phe			976
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1 Thr Lys Val Ile 65 Leu Gln	<pre>&lt;: chapter Gly Ala Cys Cys 50 Glu Arg Arg Ser Asp</pre>	213> 400> Phe Pro Tyr 35 Leu Phe Pro Ile Gly 115 Phe	98 Ala Ser 20 Ala Lys Leu Asn Lys 100 Glu	Asp 5 Lys Leu Cys Cys Asp 85 Lys	Phe Glu Met His Asp 70 Pro Tyr	Phe Glu Tyr Tyr 55 Val Leu Glu Ile	Lys Gln His 40 His Gly Asn Lys Asn 120	Pro 25 Lys Phe Ser Phe Arg 105 Arg	10 Ser Glu Arg Phe Val 90 Thr	His Val Met Glu 75 Asp Asn	Trp Phe Lys 60 Glu Lys Arg Leu Ser	Val Ser 45 Ala Phe Glu Pro Gln 125	Lys 30 Lys Ala Asp Ser 110 Ile	Tyr Glu Lys Tyr 95 Ser Val	Pro Ser Arg His 80 Lys Val	
1 Thr Lys Val Ile 65 Leu Gln Ile Phe	Cys Cys So Glu Arg Arg Ser Asp 130 Ile	213> 400> Phe Pro Tyr 35 Leu Phe Pro Ile Gly 115 Phe	98 Ala Ser 20 Ala Lys Leu Asn Lys 100 Glu Ser	Asp 5 Lys Leu Cys Cys Asp 85 Lys Ala	Phe Glu Met His Asp 70 Pro Tyr Lys Met Ile	Phe Glu Tyr Tyr 55 Val Leu Glu Ile Gly 135	Lys Gln His 40 His Gly Asn Lys Asn 120 Gly	Pro 25 Lys Phe Ser Phe Arg 105 Arg	10 Ser Glu Arg Phe Val 90 Thr Met Leu	His Val Met Glu 75 Asp Asn Pro Gly Ala	Trp Phe Lys 60 Glu Lys Arg Leu Ser 140	Val Ser 45 Ala Phe Glu Pro Gln 125 Val	Lys 30 Lys Ala Asp Ser 110 Ile	Tyr Glu Lys Tyr 95 Ser Val	Pro Ser Arg His 80 Lys Val Val Glu Leu	
1 Thr Lys Val Ile 65 Leu Gln Ile Phe Lys 145	Cys Cys So Glu Arg Arg Ser Asp 130 Ile	213> 400> Phe Pro Tyr 35 Leu Phe Pro Ile Gly 115 Phe Val	98 Ala Ser 20 Ala Lys Leu Asn Lys 100 Glu Ser Arg	Asp 5 Lys Leu Cys Cys Asp 85 Lys Ala Phe Ala	Phe Glu Met His Asp 70 Pro Tyr Lys Met Ile 150 Ser	Phe Glu Tyr Tyr 55 Val Leu Glu Ile Gly 135 Asn	Lys Gln His 40 His Gly Asn Lys Asn 120 Gly Arg	Pro 25 Lys Phe Ser Phe Arg 105 Arg Ser Ala	10 Ser Glu Arg Phe Val 90 Thr Met Leu Val Arg	His Val Met Glu 75 Asp Asn Pro Gly Ala 155	Trp Phe Lys 60 Glu Lys Arg Leu Ser 140 Lys	Val Ser 45 Ala Phe Glu Pro Gln 125 Val	Lys 30 Lys Ala Asp Ser 110 Ile Glu	Tyr Glu Lys Tyr 95 Ser Val Gly Ala	Pro Ser Arg His 80 Lys Val Val Glu Leu 160 Tyr	
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Phe Leu Pro	Lys Leu Arg	aat att ttg Asn Ile Leu	His Leu	Gly Tyr Il	e Trp Glu	307
aga gaa atg Arg Glu Met	gag cgc ttg Glu Arg Leu 75	ttt ttt tgg Phe Phe Trp 80	Gln Arg	Phe Cys Al	t ctc ttg a Leu Leu 5	355
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act tta gat Thr Leu Asp 105	gat ggg gct Asp Gly Ala	aac aaa cto Asn Lys Leu 110	gcc aaa Ala Lys	cag cac co Gln His Pr 115	c tta aga o Leu Arg	451
gtg att tta Val Ile Leu 120	gaa atg tat Glu Met Tyr 125	gca acg ctt Ala Thr Leu	ttg aat Leu Asn 130	Phe Glu Gl	g cgc ttg y Arg Leu 135	499

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gct Ala	aaa Lys	agc Ser 170	cta Leu	aat Asn	tta Leu	gaa Glu	aaa Lys 175	atc Ile	caa Gln	gct Ala	ttt Phe	ttt Phe 180	cgc Arg	act Thr	caa Gln	643
agc Ser	acg Thr 185	att Ile	gat Asp	tta Leu	gaa Glu	aca Thr 190	gaa Glu	gaa Glu	gta Val	gaa Glu	gaa Glu 195	tta Leu	tgg Trp	cgc Arg	acg Thr	691
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gtg ggc Val Gly	gat gtg Asp Val 160	aaa ctt Lys Leu	tat Tyr	aaa Lys 165	gac Asp	act Thr	tac Tyr	acc Thr	cct Pro 170	tta Leu	ttg Leu	ctc Leu	590
		aca cct Thr Pro											638

agt t Ser L 190																686
tgc g Cys A																734
att t																782
aaa a Lys A	sn	atc Ile 240	cac His	att Ile	att Ile	ttt Phe	gat Asp 245	gaa Glu	atc Ile	gct Ala	acc Thr	ggg Gly 250	ttt Phe	Gly ggg	cgc Arg	830
aca g Thr G 2																878
tta t Leu C 270																926
cta t Leu L																974
gaa a Glu A																1022
gca t Ala C	'ys															1070
gtt a Val I 3																1118
caa a Gln A 350																1166
agg c Arg H	at His	ttg Leu	ggc Gly	atg Met 370	gtc Val	ttt Phe	gcc Ala	ttt Phe	gaa Glu 375	gtc Val	ttt Phe	att Ile	caa Gln	acc Thr 380	aaa Lys	1214
gag c Glu A																1262
tta t Leu L																1310
atc a Ile T 4																1358

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Ile Lys Lys Ala Gln Gly Ile Tyr Leu Tyr Asp Phe Asn Asp Asn Ala
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Tyr Met Asp Leu Ile Ser Ser Trp Trp Val Asn Leu Phe Gly His Asn
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Asn Ala Tyr Ile Ser Gln Gln Leu Lys Asn Gln Ile Asp Asp Leu Glu
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His Val Leu Leu Ala Ser Phe Ser His Lys Pro Ile Ile Thr Leu Ser
                                    90
               85
Gln Arg Leu Cys Gln Leu Thr His Met Asp Lys Cys Phe Tyr Ala Asp
                                105
                                                    110
Asn Gly Ser Ser Cys Val Glu Ile Ala Leu Lys Met Ser Tyr His Ala
                            120
                                                125
His Phe Leu Lys Asn Gln Thr Arg Arg Lys Lys Leu Phe Leu Ser Leu
                        135
                                           140
Ser Asn Ser Tyr His Gly Glu Thr Leu Gly Ala Leu Ser Val Gly Asp
                    150
                                       155
Val Lys Leu Tyr Lys Asp Thr Tyr Thr Pro Leu Leu Lys Asn Leu
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                165
Thr Thr Pro Val Pro Lys Asn Asp His Glu Ile Glu Asn Ser Leu Asn
            180
                                185
Ala Leu Lys Arg Leu Leu Asp Lys His Ser Glu Glu Ile Cys Ala Phe
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                                                205
Ile Ala Glu Pro Leu Leu Gln Cys Ala Gly Asn Met His Ile Tyr Ser
                        215
                                            220
Ala Arg Tyr Leu Lys Gln Ala Val Leu Leu Cys Lys Gln Lys Asn Ile
                    230
                                        235
His Ile Ile Phe Asp Glu Ile Ala Thr Gly Phe Gly Arg Thr Gly Ser
                                    250
                245
Met Phe Ala Tyr Glu Gln Cys Glu Ile Lys Pro Asp Phe Leu Cys Leu
                                265
                                                    270
Ser Lys Gly Ile Ser Gly Gly Tyr Leu Pro Leu Ser Ala Leu Leu Thr
                            280
                                                285
His Asn Glu Ile Tyr Asn Gln Phe Tyr Ala Pro Tyr Glu Glu Asn Lys
                        295
                                            300
Ala Phe Leu His Ser His Ser Tyr Thr Gly Asn Ala Leu Ala Cys Ala
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                                        315
Cys Ala Asn Ala Thr Leu Asp Ile Phe Glu Lys Glu Asn Val Ile Glu
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Lys Asn Lys Ala Leu Ser Gly Phe Ile Phe Asn Thr Leu Gln Asn Ala
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340 345 350

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                        375
Ser Leu Ala Val Phe Lys Lys Thr Leu Lys Lys Gly Leu Leu Leu Arg
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                                        395
Pro Leu Asn Asn Thr Ile Tyr Leu Met Pro Pro Tyr Ile Ile Thr His
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                        Met Gly Lys Met Lys Gln Glu Thr Ala Ile
                                                                      159
gac tat gaa aaa tta gcg aat cat tgg aat aat aat gat gaa aac agc
Asp Tyr Glu Lys Leu Ala Asn His Trp Asn Asn Asn Asp Glu Asn Ser
                                      20
                                                                      207
gaa gca cta aac gct ttt gca gac gct tac ctt tat aaa cat gag aaa
Glu Ala Leu Asn Ala Phe Ala Asp Ala Tyr Leu Tyr Lys His Glu Lys
                                  35
                                                                      255
aag agt caa aag att cgg gca ata gag ata agt tct cta aac aaa gcc
Lys Ser Gln Lys Ile Arg Ala Ile Glu Ile Ser Ser Leu Asn Lys Ala
                             50
                                                                      304
tgc atg gga gaa ttt tac cac aaa aac cca aaa tta ttt taataacgat
Cys Met Gly Glu Phe Tyr His Lys Asn Pro Lys Leu Phe
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                                                                      360
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                                 25
Ala Asp Ala Tyr Leu Tyr Lys His Glu Lys Lys Ser Gln Lys Ile Arg
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65

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70

Ser Ile Val Lys Asn Leu Glu Lys Ile Ala Leu Asp Phe Lys Ser Asp

190 185 180 aga cat agt att tcg caa aga gct ttt gaa ttt ttt aag tat atg aat 685 Arg His Ser Ile Ser Gln Arg Ala Phe Glu Phe Phe Lys Tyr Met Asn 200 195 tat caa aat tta agc ttg act gat aaa ggc aat atg ttt tta gtg gct 733 Tyr Gln Asn Leu Ser Leu Thr Asp Lys Gly Asn Met Phe Leu Val Ala 781 aag ttt ttt aaa gat agt gct tta ctt gtt aat att gct agg ttt gaa Lys Phe Phe Lys Asp Ser Ala Leu Leu Val Asn Ile Ala Arg Phe Glu 230 829 atg aaa aag ata gat gat agt gtt aaa aat tct aac cca caa gac aat Met Lys Lys Ile Asp Asp Ser Val Lys Asn Ser Asn Pro Gln Asp Asn 250 245 877 tta tta gac aaa caa gtt tgg ctc aat ctt tta gag cat tta aaa aga Leu Leu Asp Lys Gln Val Trp Leu Asn Leu Leu Glu His Leu Lys Arg 265 925 ctt gaa gag gaa aat tat tgt ttt gct aag aaa cga aaa gaa ttc tta Leu Glu Glu Glu Asn Tyr Cys Phe Ala Lys Lys Arg Lys Glu Phe Leu 280 973 gag act aga gcg atg gag cta tca aaa gat tta aaa ttt tta aca cag Glu Thr Arg Ala Met Glu Leu Ser Lys Asp Leu Lys Phe Leu Thr Gln 295 1021 gct aat gaa aat gat ttg ccc att tat gaa aga ggg caa agg gat aaa Ala Asn Glu Asn Asp Leu Pro Ile Tyr Glu Arg Gly Gln Arg Asp Lys 310 315 atc att aaa cgc tgt gaa aaa tcg ctt aac ttt ttg cag aaa gaa tta 1069 Ile Ile Lys Arg Cys Glu Lys Ser Leu Asn Phe Leu Gln Lys Glu Leu 330 caa tgc ttt aaa acc tta ttg aaa agt gca agt ata gct tta gaa aac 1117 Gln Cys Phe Lys Thr Leu Leu Lys Ser Ala Ser Ile Ala Leu Glu Asn 345 1165 ttg caa aat aac cat caa atc aca gcc gtt aca caa gac acg caa gaa Leu Gln Asn Asn His Gln Ile Thr Ala Val Thr Gln Asp Thr Gln Glu 360 aac aca aac gcg ctc aaa aat act act caa gat ttt aac aaa act acc 1213 Asn Thr Asn Ala Leu Lys Asn Thr Thr Gln Asp Phe Asn Lys Thr Thr 375 1255 aat gaa cca aca aac cct aac aat aac tat gga atg gat ttt Asn Glu Pro Thr Asn Pro Asn Asn Asn Tyr Gly Met Asp Phe 390 1300 taaaaccatc cataaaatta aataacttta cttagcgtat ttttt

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His Leu Asp Ser Leu Lys Ser Leu Leu Glu Lys Thr His Trp Glu Lys
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Glu Lys Phe Thr Pro Pro Ile Asn Glu Lys Glu Leu Asn Arg Gln Leu
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Tyr Lys Lys Ile Gln Lys Leu Ala Val Tyr Lys Ser Pro Leu Ile Lys
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           100
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Phe Ser Lys Asp Leu Glu Thr Asp Leu Ser His Ser Lys Lys Arg Phe
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                    150
Glu Leu Tyr Thr Arg Leu Lys Ser Met Ser Lys Val Phe Ile Ser Lys
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                                   170
Ser Ile Val Lys Asn Leu Glu Lys Ile Ala Leu Asp Phe Lys Ser Asp
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Arg His Ser Ile Ser Gln Arg Ala Phe Glu Phe Phe Lys Tyr Met Asn
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Tyr Gln Asn Leu Ser Leu Thr Asp Lys Gly Asn Met Phe Leu Val Ala
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                                           220
Lys Phe Phe Lys Asp Ser Ala Leu Leu Val Asn Ile Ala Arg Phe Glu
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Met Lys Lys Ile Asp Asp Ser Val Lys Asn Ser Asn Pro Gln Asp Asn
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                                        315
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                325
Gln Cys Phe Lys Thr Leu Leu Lys Ser Ala Ser Ile Ala Leu Glu Asn
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Leu Gln Asn Asn His Gln Ile Thr Ala Val Thr Gln Asp Thr Gln Glu
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Asn Thr Asn Ala Leu Lys Asn Thr Thr Gln Asp Phe Asn Lys Thr Thr
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<sup>&</sup>lt;213> Helicobacter pylori

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Lys	Asp 50		Glu	Ser	Glu	Leu 55	Va1	Glu	Phe	Asp	Gly 60	Glu	Ser	Asp	His	
Val 65		Leu	Leu	Ile	Asn 70	Tyr	Pro	Pro	Lys	Val 75	Ser	Val	Ser	Lys	Leu 80	
	Asn	Ser	Leu	Lys 85	Gly	Val	Ser	Ser	Arg 90	Leu	Thr	Arg	Gln	His 95	His	
Phe	Lys	Ser	Val 100	Glu	Ala	Ser	Leu	Trp 105	Gly	Lys	His	Leu	Trp 110	Ser	Pro	
Ser	Tyr	Phe 115	Ala	Gly	Ser	Cys	Gly 120	Asp	Ala	Pro	Leu	Glu 125	Met	Ile	Lys	
Gln	Tyr 130	Ile	Gln	Asp	Gln	Glu 135	Thr	Pro	His							
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tct Ser	agc Ser	gcg Ala	ttg Leu	att Ile 10	acg Thr	cct Pro	ttt Phe	aaa Lys	aaa Lys 15	gat Asp	ttg Leu	agc Ser	gtt Val	gat Asp 20	gag Glu	163
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aaa Lys	gag Glu 55	cac His	atg Met	cgt Arg	tgc Cys	att Ile 60	gaa Glu	atc Ile	gcc Ala	ata Ile	gaa Glu 65	act Thr	tgc Cys	aaa Lys	aac Asn	307
act Thr 70	aaa Lys	acg Thr	ccc Pro	tca Ser	aat Asn 75	tcg Ser	cgc Arg	atg Met	aaa Lys	gtg Val 80	tta Leu	gcc Ala	ggc	gtg Val	ggc Gly 85	355
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			gat Asp 105													451
acc	caa	caa	ggc	ttg	ttt	gaa	cat	tat	aaa	acc	atc	gct	caa	tcg	gtg	499

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Lys Ala Ile Lys Glu Ala Ser Gly Ser Leu Lys Arg Val Thr Glu Leu 170 170 175 175 180 180 180 180 180 180 180 180 180 180	Ile Glu Val	Pro Thr Ala	a Leu Lys	ctc ttt Leu Phe	Arg Glu	gtc cct Val Pro	Asn Ile	595
His Tyr Tyr Glu Lys Asp Phe Lys Tle Phe Ser Gly Glu Asp Ser Leu 185  aac cac tcc atc atg ttt tca ggg ggg tgc ggc gtg att tca gtg acc Asn His Ser Ile Met Phe Ser Gly Gly Cys Gly Val Ile Ser Val Thr 200 210  ggt aat tta atg ccc aat ctg att tca caa atg gtc aat tgc gcg ctc Gly Asn Leu Met Pro Asn Leu Ile Ser Gln Met Val Asn Cys Ala Leu 215  aaa caa aaa tac caa caa gcc cta gaa atc caa aat aag ctt ttt tgt Lys Gln Lys Tyr Gln Gln Ala Leu Glu Ile Gln Asn Lys Leu Phe Cys 230  240  ttg cac caa gcc ctt ttt gta gaa aca aat ccc atc cct att aaa atg Leu His Gln Ala Leu Phe Val Glu Thr Asn Pro Ile Pro Ile Lys Met 250  gct atg cat tta gcc ggc ttg att gaa aac cca agc tac aga ctg cct Ala Met His Leu Ala Gly Leu Ile Glu Asn Pro Ser Tyr Arg Leu Pro 275  tta gtg gcc cca agc aaa gaa acg att caa ctt tta gaa aaa act tta gtg gtg gcc cca agc aaa gaa acg att caa ctt tta gaa aaa act tta 280  caa caa tat gag gta att gca tgaatggttc caatcacatg aaaaataaaa 2979  caa caa tat gag gta att gca tgaatggttc caatcacatg aaaaataaaa 1030  ccctagtgat cagcggcgcg actagaggga ttggcaaggc gatattgtac 1080	aaa gcc att Lys Ala Ile	Lys Glu Ala	g tct ggc a Ser Gly	Ser Leu	aaa agg Lys Arg	gta aca Val Thr	Glu Leu	643
Asn His Ser Ile Met Phe Ser Gly Gly Cys Gly Val Ile Ser Val Thr 200    ggt aat tta atg ccc aat ctg att tca caa atg gtc aat tgc gcg ctc Gly Asn Leu Met Pro Asn Leu Ile Ser Gln Met Val Asn Cys Ala Leu 215    aaa caa aaa tac caa caa gcc cta gaa atc caa at aag ctt ttt tgt Lys Gln Lys Tyr Gln Gln Ala Leu Glu Ile Gln Asn Lys Leu Phe Cys 230    ttg cac caa gcc ctt ttt gta gaa aca aat ccc atc cct att aaa atg Leu His Gln Ala Leu Phe Val Glu Thr Asn Pro Ile Pro Ile Lys Met 250    gct atg cat tta gcc ggc ttg att gaa aac cca agc tac aga ctg cct Ala Met His Leu Ala Gly Leu Ile Glu Asn Pro Ser Tyr Arg Leu Pro 265    tta gtg gcc cca agc aaa gaa aca att caa ctt tta gaa aaa act tta 1280    tta gtg gcc cca agc aaa gaa aca att caa ctt tta gaa aaa act tta 1280    caa caa tat gag gta att gca tgaatggttc caatcacatg aaaaataaaa    caa caa tat gag gta att gca tgaatggttc caatcacatg aaaaataaaa    caa caa tat gag gta att gca tgaatggttc caatcacatg aaaaataaaa    ccctagtgat cagcggcgc actagaggga ttggcaaggc gatattgtac    ccctagtgat cagcggcgc actagaggga ttggcaaggc gatattgtac    ccctagtgat cagcggcgcg actagaggga ttggcaaggc gatattgtac    ccctagtgat Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1    Met Gln Phe His Ser Ser Ser Ala Leu		Glu Lys As		Ile Phe		Glu Asp		691
Gly Asn Leu Met Pro Asn Leu Ile Ser Gln Met Val Asn Cys Ala Leu 215  aaa caa aaa tac caa caa gcc cta gaa atc caa aat aag ctt ttt tgt Lys Gln Lys Tyr Gln Gln Ala Leu Glu Ile Gln Asn Lys Leu Phe Cys 240  ttg cac caa gcc ctt ttt gta gaa aca aat ccc atc cct att aaa atg Leu His Gln Ala Leu Phe Val Glu Thr Asn Pro Ile Pro Ile Lys Met 250  gct atg cat tta gcc ggc ttg att gaa aac cca agc tac aga ctg cct Ala Met His Leu Ala Gly Leu Ile Glu Asn Pro Ser Tyr Arg Leu Pro 265  tta gtg gcc cca agc aaa gaa acg att caa ctt tta gaa aaa act tta Leu Val Ala Pro Ser Lys Glu Thr Ile Gln Leu Leu Glu Lys Thr Leu 280  caa caa tat gag gta att gca tgaatggttc caatcacatg aaaaataaaa 1030  ccctagtgat cagcggcgcg actagaggga ttggcaaggc gatattgtac 1080	Asn His Ser		e Ser Gly	Gly Cys		Ile Ser		739
Lys Gln Lys Tyr Gln Gln Ala Leu Glu Ile Gln Asn Lys Leu Phe Cys 245  ttg cac caa gcc ctt ttt gta gaa aca aat ccc atc cct att aaa atg Leu His Gln Ala Leu Phe Val Glu Thr Asn Pro Ile Pro Ile Lys Met 250  gct atg cat tta gcc ggc ttg att gaa aac cca agc tac aga ctg cct Ala Met His Leu Ala Gly Leu Ile Glu Asn Pro Ser Tyr Arg Leu Pro 265  tta gtg gcc cca agc aaa gaa acg att caa ctt tta gaa aaa act tta 1 gag gcc cca agc aag gaa acg att caa ctt tta gaa aaa act tta 1 gag gcc cca agc aaa gaa acg att caa ctt tta gaa aaa act tta 1 gag gcc cca agc aaa gaa acg att caa ctt tta gaa aaa act tta 280  caa caa tat gag gta att gca tgaatggttc caatcacatg aaaaataaaa 1030 Gln Gln Tyr Glu Val Ile Ala 295 300  ccctagtgat cagcggcgcg actagaggga ttggcaaggc gatattgtac 1080 <pre> </pre> <pre> cctagtgat cagcggcgcg actagaggga ttggcaaggc gatattgtac 1080  <pre></pre></pre>	Gly Asn Leu	atg ccc aa Met Pro As:	n Leu Ile	tca caa Ser Gln	Met Val	aat tgc Asn Cys	gcg ctc Ala Leu	787
Leu His Gln Ala Leu Phe Val Glu Thr Asn Pro Ile Pro Ile Lys Met 250 255 260  gct atg cat tta gcc ggc ttg att gaa aac cca agc tac aga ctg cct Ala Met His Leu Ala Gly Leu Ile Glu Asn Pro Ser Tyr Arg Leu Pro 265 270 275  tta gtg gcc cca agc aaa gaa acg att caa ctt tta gaa aaa act tta Leu Val Ala Pro Ser Lys Glu Thr Ile Gln Leu Leu Glu Lys Thr Leu 280 285 290  caa caa tat gag gta att gca tgaatggttc caatcacatg aaaaataaaa 1030 Gln Gln Tyr Glu Val Ile Ala 295 300  ccctagtgat cagcggcgcg actagaggga ttggcaaggc gatattgtac 1080  <210> 116 <211> 300 <212> PRT <213> Helicobacter pylori  <400> 116  Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1 5	Lys Gln Lys	Tyr Gln Gl:	n Ala Leu	gaa atc Glu Ile	Gln Asn	aag ctt Lys Leu	Phe Cys	835
Ala Met His Leu Ala Gly Leu Ile Glu Asn Pro Ser Tyr Arg Leu Pro 265 270 275  tta gtg gcc cca agc aaa gaa acg att caa ctt tta gaa aaa act tta 1979  Leu Val Ala Pro Ser Lys Glu Thr Ile Gln Leu Leu Glu Lys Thr Leu 280 285 290  caa caa tat gag gta att gca tgaatggttc caatcacatg aaaaataaaa 1030  Gln Tyr Glu Val Ile Ala 295 300  ccctagtgat cagcggcgcg actagaggga ttggcaaggc gatattgtac 1080  <210> 116 <211> 300 <212> PRT <213> Helicobacter pylori  <400> 116  Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1 5 10	ttg cac caa Leu His Gln	Ala Leu Ph	t gta gaa e Val Glu	Thr Asn	ccc atc Pro Ile	cct att Pro Ile	Lys Met	883
Leu Val Ala Pro Ser Lys Glu Thr Ile Gln Leu Leu Glu Lys Thr Leu 280 285 290  caa caa tat gag gta att gca tgaatggttc caatcacatg aaaaataaaa 1030 Gln Gln Tyr Glu Val Ile Ala 295 300  ccctagtgat cagcggcgcg actagaggga ttggcaaggc gatattgtac 1080  <210> 116 <211> 300 <212> PRT <213> Helicobacter pylori  <400> 116  Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1 5 10	gct atg cat Ala Met His	Leu Ala Gl	c ttg att y Leu Ile	Glu Asn	cca agc Pro Ser	Tyr Arg	ctg cct Leu Pro	931
Gln Gln Tyr Glu Val Ile Ala 295 300  ccctagtgat cagcggcgcg actagaggga ttggcaaggc gatattgtac 1080  <210> 116 <211> 300 <212> PRT <213> Helicobacter pylori  <400> 116  Met Gln Phe His Ser Ser Ser Ala Leu Ile Thr Pro Phe Lys Lys Asp 1 5 10 15	Leu Val Ala	Pro Ser Ly	s Glu Thr	Ile Gln	Leu Leu	Glu Lys		979
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1 5 10 15			r Ser Ala	. Leu Ile	Thr Pro	Phe Lys	Lys Asp	
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Phe Gln Gly Met Asp Ala Cys Val Pro Val Gly Thr Thr Gly Glu Ser
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Ala Thr Leu Thr His Lys Glu His Met Arg Cys Ile Glu Ile Ala Ile
Glu Thr Cys Lys Asn Thr Lys Thr Pro Ser Asn Ser Arg Met Lys Val
                    70
Leu Ala Gly Val Gly Ser Asn Ala Thr Ser Glu Ser Leu Ser Leu Ala
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Lys Phe Ala Gln Lys Ile Gly Ala Asp Ala Ile Leu Cys Val Ser Pro
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Tyr Tyr Asn Arg Pro Thr Gln Gln Gly Leu Phe Glu His Tyr Lys Thr
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Arg Thr Gly Val Ser Ile Glu Val Pro Thr Ala Leu Lys Leu Phe Arg
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                   150
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                                                        175
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Arg Val Thr Glu Leu His Tyr Tyr Glu Lys Asp Phe Lys Ile Phe Ser
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Gly Glu Asp Ser Leu Asn His Ser Ile Met Phe Ser Gly Gly Cys Gly
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Val Ile Ser Val Thr Gly Asn Leu Met Pro Asn Leu Ile Ser Gln Met
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Val Asn Cys Ala Leu Lys Gln Lys Tyr Gln Gln Ala Leu Glu Ile Gln
                   230
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Asn Lys Leu Phe Cys Leu His Gln Ala Leu Phe Val Glu Thr Asn Pro
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                                    250
Ile Pro Ile Lys Met Ala Met His Leu Ala Gly Leu Ile Glu Asn Pro
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        Met Leu Leu Ile Val Phe Phe Lys Phe Tyr Phe Gln Tyr Ser
att aaa aaa aaa tca ttt tat ttt att ttt gtt ata att caa gct att
                                                                      157
Ile Lys Lys Lys Ser Phe Tyr Phe Ile Phe Val Ile Ile Gln Ala Ile
ttt att ttc aat cta agg agg tgt cgc atg gac aat caa aag ata acg
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Phe Ile Phe Asn Leu Arg Arg Cys Arg Met Asp Asn Gln Lys Ile Thr
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cat caa aat atc acg caa aaa caa ggc gag ctt aaa aga gac atg aaa
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ctt Leu	ttt Phe 80	gta Val	ggc Gly	act Thr	Gly ggg	ggt Gly 85	aat Asn	att Ile	gcg Ala	agc Ser	gct Ala 90	ggc Gly	cct Pro	tta Leu	Gl <sup>A</sup> aaa	34	9
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Gly gaa	gtg Val	gct Ala	gtg Val	gga Gly 275	gag Glu	act Thr	aaa Lys	aac Asn	gct Ala 280	agc Ser	gaa Glu	gtg Val	atg Met	ccc Pro 285	aaa Lys	92	25

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caa agc cct t Gln Ser Pro I 320			Arg Ile A			
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atg att tat g Met Ile Tyr (			Met Phe I	Phe Lys V		
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tgg gtt agc g Trp Val Ser V						
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ccc ttt ttg ( Pro Phe Leu ( 465						
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gtt ttc gct g Val Phe Ala V 495						.a
aat gaa aat a Asn Glu Asn A				tc ttaatt	ttga	1644

<213> Helicobacter pylori

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<u>L</u>

m

T.

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1-5

ttagc

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Asn Arg Gln Gly Thr Pro Thr Tyr Ala Met Phe Phe Ser Leu Ser Phe

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Glu Ala Leu Ile Asn Val Ile Ser Phe Thr Val Ile Ile Val Trp Val
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                         90
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10

Ile Ser Lys Asp Gly Tyr Ile Val Thr Asn Asn His Val Ile Asp Gly 2.0 25 Ala Asp Lys Ile Lys Val Thr Ile Pro Gly Ser Asn Lys Glu Tyr Ser 40 45 Ala Thr Leu Val Gly Thr Asp Ser Glu Ser Asp Leu Ala Val Ile Arg 55 60 Ile Thr Lys Asp Asn Leu Pro Thr Ile Lys Phe Ser Asp Ser Asn Asp 70 75 Ile Ser Val Gly Asp Leu Val Phe Ala Ile Gly Asn Pro Phe Gly Val 90 Gly Glu Ser Val Thr Gln Gly Ile Val Ser Ala Leu Asn Lys Ser Gly 105 Ile Gly Ile Asn Ser Tyr Glu Asn Phe Ile Gln Thr Asp Ala Ser Ile 120 125 Asn Pro Gly Asn Ser Gly Gly Ala Leu Ile Asp Ser Arg Gly Gly Leu 135 Val Gly Ile Asn Thr Ala Ile Ile Ser Lys Thr Gly Gly Asn His Gly 150 Ile Gly Phe Ala Ile Pro Ser Asn Met Val Lys Asp Thr Val Thr Gln 170 Leu Ile Lys Thr Gly Lys Ile Glu Arg Gly Tyr Leu Gly Val Gly Leu 185 Gln Asp Leu Ser Gly Asp Leu Gln Asn Ser Tyr Asp Asn Lys Glu Gly 200 205 Ala Val Val Ile Ser Val Glu Lys Asp Ser Pro Ala Lys Lys Ala Gly 215 220 Ile Leu Val Trp Asp Leu Ile Thr Glu Val Asn Gly Lys Lys Val Lys 230 235 Asn Thr Asn Glu Leu Arg Asn Leu Ile Gly Ser Met Leu Pro Asn Gln 250 245 Arg Val Thr Leu Lys Val Ile Arg Asp Lys Lys Glu Arg Ala Phe Thr 265 Leu Thr Leu Ala Glu Arg Lys Asn Pro Asn Lys Lys Glu Thr Ile Ser 280

5

Ala	Gln 290	Asn	Gly	Ala	Gln	Gly 295	Gln	Leu	Asn	Gly	Leu 300	Gln	Val	Glu	Asp	
Leu 305		Gln	Glu	Thr	Lys 310		Ser	Met	Arg	Leu 315	Ser	Asp	Asp	Val	Gln 320	
				325					330					Gln 335		
			340					345					350	Glu		
_		355					360					365		Gly		
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Leu 385	Val	Lys														
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														aaa Lys		104
														aaa Lys		152
														gaa Glu		200
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atg Met	ttt Phe	ggc Gly	Gly aaa	cag Gln 75	aat Asn	ttc Phe	agc Ser	gat Asp	ttt Phe 80	gcc Ala	aga Arg	agc Ser	cgt Arg	ggt Gly 85	cct Pro	296
agt Ser	gaa Glu	gat Asp	tta Leu 90	gac Asp	gat Asp	att Ile	tta Leu	agc Ser 95	tct Ser	att Ile	ttt Phe	ggg Gly	aaa Lys 100	gga Gly	ggc Gly	344
														ttt Phe		392
														tta Leu		440

125 130 120 488 gtc tct gtt tta gac acc ctt tta ggc aat aaa aaa caa gtg agc atc Val Ser Val Leu Asp Thr Leu Leu Gly Asn Lys Lys Gln Val Ser Ile 140 536 aat aat gag act ttt agc ctt aaa atc cct att ggc gtg gaa gag ggc Asn Asn Glu Thr Phe Ser Leu Lys Ile Pro Ile Gly Val Glu Gly gaa aag att agg gtt cgc aac aag ggg aaa acg ggg cga acg act agg 584 Glu Lys Ile Arg Val Arg Asn Lys Gly Lys Thr Gly Arg Thr Thr Arg 175 632 ggc gat ttg ctc tta gag atc cat att gaa gaa gat gaa atg tat agg Gly Asp Leu Leu Glu Ile His Ile Glu Glu Asp Glu Met Tyr Arg 190 680 cgc gag aaa gat gat att acc caa atc ttt gat tta ccc tta aaa acg Arg Glu Lys Asp Asp Ile Thr Gln Ile Phe Asp Leu Pro Leu Lys Thr 205 728 gct ctt ttt gga ggg aaa att gaa atc gct act tgg cat aaa acc tta Ala Leu Phe Gly Gly Lys Ile Glu Ile Ala Thr Trp His Lys Thr Leu 220 225 776 acc cta acc att ccc cct aac acc aaa gcg atg caa aaa ttc cgc att Thr Leu Thr Ile Pro Pro Asn Thr Lys Ala Met Gln Lys Phe Arg Ile 240 824 aaa gaa aaa ggg atc aaa aac aga aaa act tcg cat gtg ggg gat ttg Lys Glu Lys Gly Ile Lys Asn Arg Lys Thr Ser His Val Gly Asp Leu 255 872 tat ttg cag gct cgt ttg att ttg cct aaa act gaa acg ctt tct aat Tyr Leu Gln Ala Arg Leu Ile Leu Pro Lys Thr Glu Thr Leu Ser Asn 270 922 gag ttg aaa gcg tta tta gaa aaa gaa ttg taaggaggaa tcgtgtgcga Glu Leu Lys Ala Leu Leu Glu Lys Glu Leu 982 ttatqatgaa ccgctttatt taatcagcgt cgtggctaaa atcttaggcg tgcaccctca 990 aaccttgc <210> 122 <211> 288 <212> PRT <213> Helicobacter pylori <400> 122 Met Ser Lys Ser Leu Tyr Gln Thr Leu Asn Val Ser Glu Asn Ala Ser 10 Gln Asp Glu Ile Lys Lys Ser Tyr Arg Arg Leu Ala Arg Gln Tyr His 25 Pro Asp Leu Asn Lys Thr Lys Glu Ala Glu Glu Lys Phe Lys Glu Ile 40

Asn Ala Ala Tyr Glu Ile Leu Ser Asp Glu Glu Lys Arg Arg Gln Tyr

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Ala Arg Ser Arg Gly Pro Ser Glu Asp Leu Asp Asp Ile Leu Ser Ser
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Ile Phe Gly Lys Gly Gly Phe Ser Gln Arg Phe Ser Gln Asn Ser Gln
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Gly Phe Ser Gly Phe Asn Phe Ser Asn Phe Ala Pro Glu Asn Leu Asp
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Ile Thr Ala Ala Leu Asn Val Ser Val Leu Asp Thr Leu Leu Gly Asn
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                                           140
Lys Lys Gln Val Ser Ile Asn Asn Glu Thr Phe Ser Leu Lys Ile Pro
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Ile Gly Val Glu Glu Gly Glu Lys Ile Arg Val Arg Asn Lys Gly Lys
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Asp Leu Pro Leu Lys Thr Ala Leu Phe Gly Gly Lys Ile Glu Ile Ala
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Thr Trp His Lys Thr Leu Thr Leu Thr Ile Pro Pro Asn Thr Lys Ala
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Met Gln Lys Phe Arg Ile Lys Glu Lys Gly Ile Lys Asn Arg Lys Thr
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                                  250
Ser His Val Gly Asp Leu Tyr Leu Gln Ala Arg Leu Ile Leu Pro Lys
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                                                         Met Ser
ctg act tcg ctt tta aac cca aaa agc cta gaa gat ttt tta ggc caa
                                                                     166
Leu Thr Ser Leu Leu Asn Pro Lys Ser Leu Glu Asp Phe Leu Gly Gln
gag cat tta gta ggg aaa gac gcc ccc tta ttt aaa gcc cta caa tcc
                                                                     214
Glu His Leu Val Gly Lys Asp Ala Pro Leu Phe Lys Ala Leu Gln Ser
                         25
aaa cac ttc ccc cat gcc ttt ttc tat ggc cct cct ggc gtg ggt aaa
                                                                     262
Lys His Phe Pro His Ala Phe Phe Tyr Gly Pro Pro Gly Val Gly Lys
aca age ctg get caa ate ate gee tat atg eta gag ege eec att ett
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Thr Ser Leu Ala Gln Ile Ile Ala Tyr Met Leu Glu Arg Pro Ile Leu
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											gtt Val					406
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											acg Thr					502
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				_	_	_		_			tgc Cys	-		-		598
											aaa Lys					646
		_	-		_	_	_				aac Asn 190			_	_	694
_	-			_	_						acg Thr					742
			_			_				-	gat Asp	-	-			790
											Gly ggg					838
											ggc Gly					886
											agc Ser 270					934
											tct Ser					982
											att Ile					1030

295 300 305

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atc aat cag gct t Ile Asn Gln Ala I 325	ttg gat Leu Asp (	tgc gtt Cys Val 330	caa Gln	aaa Lys	ggc Gly	tca Ser	ctc Leu 335	tac Tyr	cct Pro	att Ile	1126
cct aaa cac ctg o Pro Lys His Leu I 340	Leu Pro 1	aac gct Asn Ala 345	aaa Lys	gat Asp	tac Tyr	ctt Leu 350	tac Tyr	ccg Pro	cat His	gat Asp	1174
tat aac ggc tat g Tyr Asn Gly Tyr N 355	gtc aaa Val Lys ( 360	caa gat Gln Asp	tat Tyr	ttg Leu	gaa Glu 365	aaa Lys	ccc Pro	cta Leu	gat Asp	ttg Leu 370	1222
gtt tct tct caa g Val Ser Ser Gln G	ggc ata ( Gly Ile ( 375	gga ttt Gly Phe	gaa Glu	aaa Lys 380	acc Thr	ctt Leu	tta Leu	gaa Glu	tgg Trp 385	ctt Leu	1270
gat aag ata aga a Asp Lys Ile Arg A 390		cttata	agtta	ıcatt	a aa	atgo	gaca	a atg	ggtaa	ntaa	1325
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His 225	Tyr	Asn	Leu	Thr	Ser 230	Ala	Leu	I1e	Lys	Ser 235	Leu	Arg	Gly	Ser	Asp 240	
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Phe	Ala 290		Lys	Gln	Ile	Gly 295		Pro	Glu	Ala	Arg 300	Ile	Ile	Leu	Ser	
Gln 305		Val	Ile	Tyr	Leu 310		Cys	Ser	Pro	Lys 315		Asn	Thr	Ala	Tyr 320	
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Pro	Ile	Pro	Lys 340		Leu	Leu	Pro	Asn 345		Lys	Asp	Tyr	Leu 350		Pro	
His	Asp	Tyr 355		Gly	Tyr	Val	Lys 360		Asp	Tyr	Leu	Glu 365		Pro	Leu	
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	<2	220> 221> 222>			(759)	,										
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					aaa Lys											159
					gtt Val											207
					ctt Leu 50											255
		_		_	gtt Val	_			_		_		-			303
				_	ttc Phe	_			_	_						351

80 85 90

											cca Pro					399
											cct Pro 120					447
											aat Asn					495
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tat Tyr	atg Met	ggt Gly	tta Leu 160	ggt Gly	ttg Leu	ggg Gly	gtt Val	gta Val 165	gcg Ala	cat His	Gly ggg	gtg Val	aat Asn 170	tac Tyr	acg Thr	591
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_			_		-						ttg Leu 200					687
											tgg Trp					735
		Gly aaa						taaa	aaaa	ata a	agaaa	atcto	ca ti	tta	igctt	789
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 Asp
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 Ile
 Asp

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 Tyr
 Ile
 Lys
 Tyr
 Tyr
 Lys
 Ala
 Tyr
 Glu
 Asp
 Lys

 Glu
 Val
 Glu
 Leu
 Ile
 Arg
 Asp
 Leu
 Lys
 Arg
 Ala
 Asn
 Ala
 Lys
 Ser

 Gly
 Leu
 Ile
 Leu
 Gly
 Ile
 Asn
 Thr
 Gly
 Phe
 Phe
 Tyr
 Asn
 His
 Glu
 Ile

 Met
 Val
 Arg
 Thr
 Asn
 Ser
 Ser
 Ser
 Ile
 Thr
 Gly
 Asn
 Ile
 Leu
 Asn
 Tyr

 65
 70
 75
 80
 75
 80
 80

Leu Phe Ala Tyr Gly Leu Arg Phe Gly Tyr Gln Thr Phe Arg Pro Ser 85 90 95

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Ile	Gln	Tyr 115	Tyr	Gly	Gly	Ala	Pro 120	Lys	Lys	Ala	Gly	Phe 125	Gly	Asp	Val	
	130	Gln				135					140					
Leu 145	Pro	Phe	Val	Gly	Lys 150	Tyr	Leu	Tyr	Met	Gly 155	Gly	Tyr	Met	Gly	Leu 160	
Gly	Leu	Gly	Val	Val 165	Ala	His	Gly	Val	Asn 170	Tyr	Thr	Ala	Glu	Trp 175	Gly	
Met	Ser	Phe	Asn 180	Ala	Gly	Leu	Ala	Leu 185	Thr	Val	Leu	Glu	Lys 190	Asn	Arg	
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Gln 225	Tyr	Val	Phe													
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tccc	<a href="#"><a href="#"><a href="#"><a href="#"><a href="#"><a href="#"><a href="#"><a href="#"><a href="#">a agaa</a></a></a></a><a href="#">a agaa</a></a></a></a><a href="#">a agaa</a></a></a> <a href="#">a agaa</a> <a href="#">a agaa<a href="#">agaa<a href="#">a agaa<a href="#">agaa<a href="#">a agaa<a href="#">agaa<a href="#">a agaa<a href="#">a agaa</a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>															

Lys Asp Ile Le 105	ı Phe Ile Asp 110	Glu Ile His	Arg Leu Ser 115		Ile 120
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ata ggc tca gg Ile Gly Ser Gl 14	y Pro Ala Ala	caa acc att Gln Thr Ile 145	aaa att gat Lys Ile Asp	tta ccc Leu Pro 150	cct 544 Pro
ttc act ctc at Phe Thr Leu Il 155					
tta aga gac ag Leu Arg Asp Ar 170					
agc gaa ctg gc Ser Glu Leu Al 185				Leu Asn	
gac atc aaa ca Asp Ile Lys Gl				_	
acg cca agg at Thr Pro Arg Il 22	e Ala Leu Arg				
cta gtc aaa aa Leu Val Lys As 235					
ttg aat gaa tt Leu Asn Glu Le 250		Glu Leu Gly			
gcg tat tta tc Ala Tyr Leu Se 265	r Leu Leu Ala	Asn Ala Gln	Gly Lys Pro	Val Gly	
aac acg att gc Asn Thr Ile Al					
gtg att gag cc Val Ile Glu Pr 30	o Phe Leu Leu				
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Glu Lys Ile Lys Ser Asn Leu Gln Ile Ser Ile Cys Ala Ala Lys Lys
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Arg Gln Glu Ser Leu Asp His Met Leu Phe Phe Gly Pro Pro Gly Leu
                       55
Gly Lys Thr Ser Ile Ser His Ile Ile Ala Lys Glu Met Glu Thr Asn
                    70
                                        75
Ile Lys Ile Thr Ala Ala Pro Met Ile Glu Lys Ser Gly Asp Leu Ala
                                   90
               85
Ala Ile Leu Thr Asn Leu Gln Ala Lys Asp Ile Leu Phe Ile Asp Glu
                               105
           100
Ile His Arg Leu Ser Pro Ala Ile Glu Glu Val Leu Tyr Pro Ala Met
                                               125
                           120
Glu Asp Phe Arg Leu Asp Ile Ile Gly Ser Gly Pro Ala Ala Gln
                        135
                                           140
Thr Ile Lys Ile Asp Leu Pro Pro Phe Thr Leu Ile Gly Ala Thr Thr
                   150
                                       155
Arg Ala Gly Met Leu Ser Asn Pro Leu Arg Asp Arg Phe Gly Met Ser
                                   170
Phe Arg Met Gln Phe Tyr Asn Pro Ser Glu Leu Ala Leu Ile Ile Lys
                               185
Lys Ala Ala Val Lys Leu Asn Gln Asp Ile Lys Gln Glu Ser Ala Asp
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                                                205
Glu Ile Ala Lys Arg Ser Arg Gly Thr Pro Arg Ile Ala Leu Arg Leu
                        215
                                           220
Leu Lys Arg Val Arg Asp Phe Ala Leu Val Lys Asn Ser Ser Leu Met
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                    230
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Glu Asp Glu Gly Thr Ile Glu Asp Val Ile Glu Pro Phe Leu Leu Ala
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gaa gat tta aaa ccg cat tta cag gaa tta aga aag cgt ttg atg gtt Glu Asp Leu Lys Pro His Leu Gln Glu Leu Arg Lys Arg Leu Met Val 5 10	164
tct gta gga acg att cta gtg gcg ttt ttg ggg tgc ttt cat ttt tgg Ser Val Gly Thr Ile Leu Val Ala Phe Leu Gly Cys Phe His Phe Trp 20 25 30	212
aaa agt att ttt gaa ttt gtt aaa aat tcc tat aaa ggc acg ctc att Lys Ser Ile Phe Glu Phe Val Lys Asn Ser Tyr Lys Gly Thr Leu Ile 35 40 45 50	260
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tca gcc gct atc gtc att tcc atg ccc att att ttt tgg caa tta tgg Ser Ala Ala Ile Val Ile Ser Met Pro Ile Ile Phe Trp Gln Leu Trp 70 75 80	356
ctc ttt atc gct cca ggg ctt tac aag aat gaa aaa aaa gtg att ttg Leu Phe Ile Ala Pro Gly Leu Tyr Lys Asn Glu Lys Lys Val Ile Leu 85 90 95	404
cct ttt gtg ttt ttt ggg agt ggg atg ttt ttg att ggg gcg gcg ttt Pro Phe Val Phe Phe Gly Ser Gly Met Phe Leu Ile Gly Ala Ala Phe 100 105 110	452
tct tat tat gtg gtg ttc cct ttc att att gaa tac tta gcc act ttt Ser Tyr Tyr Val Val Phe Pro Phe Ile Ile Glu Tyr Leu Ala Thr Phe 115 120 125 130	500
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gcc att atc act ccc cct gat gtg gtg agt caa atc ttt atg gcg ttg Ala Ile Ile Thr Pro Pro Asp Val Val Ser Gln Ile Phe Met Ala Leu 195 200 205 210	740
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agaaa	_	_	-								agct	cacco	ccg t	ctttg	gcccaa	949 989
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Phe '	Trp	Lys 35		Ile	Phe	Glu	Phe 40		Lys	Asn	Ser	Tyr 45		Gly	Thr	
Leu	Ile 50		Leu	Ser	Pro	Ile 55		Gly	Val	Met	Val 60		Val	Lys	Ile	
Ser 65		Ser	Ala	Ala	Ile 70		Ile	Ser	Met	Pro 75		Ile	Phe	Trp	Gln 80	
Leu '	Trp	Leu	Phe	Ile 85		Pro	Gly	Leu	Tyr 90		Asn	Glu	Lys	Lys 95		
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Ala	Phe	Ser 115		Tyr	Val	Val	Phe 120		Phe	Ile	Ile	Glu 125	Tyr	Leu	Ala	
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Val . 145	Ser	Phe	Phe	Thr	Arg 150	Leu	Ile	Leu	Gly	Phe 155	G1y	Val	Ala	Phe	Glu 160	
Leu	Pro	Val	Leu	Ala 165	Tyr	Phe	Leu	Ala	Lys 170	Val	Gly	Leu	Ile	Thr 175	Asp	
Ala	Ser	Leu	Lys 180		Tyr	Phe	Lys	Tyr 185		Ile	Val	Val	Ile 190		Ile	
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ttt atg cgc cct tta aac acc aac aag ctt tta caa ggg gct tca atc Phe Met Arg Pro Leu Asn Thr Asn Lys Leu Leu Gln Gly Ala Ser Ile 25 30 35 40	150
ctt caa ggc tat gaa gtg aat cct aaa aac gat tgg gct tat tct agg Leu Gln Gly Tyr Glu Val Asn Pro Lys Asn Asp Trp Ala Tyr Ser Arg 45 50 55	198
tat tat ttc ttt ata gat tat ggc aat gtg ctt ttt aat aat gac tct Tyr Tyr Phe Phe Ile Asp Tyr Gly Asn Val Leu Phe Asn Asn Asp Ser 60 65 70	246
act tta caa gcg aac atg ttc act tat ggg gtg gga ggg gat ttt atg Thr Leu Gln Ala Asn Met Phe Thr Tyr Gly Val Gly Gly Asp Phe Met 75 80 85	294
gtc gcc tac gct aaa aac cct atc aac cgc tgg gct ttt ttc ttt ggc Val Ala Tyr Ala Lys Asn Pro Ile Asn Arg Trp Ala Phe Phe Gly 90 95 100	342
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act tat ttc agg gct att ggg aag ttt ggg gtg cag ttt cgc acg atc Thr Tyr Phe Arg Ala Ile Gly Lys Phe Gly Val Gln Phe Arg Thr Ile $140$ $145$ $150$	486
gtt ttg tat cat aag gtg gat gta gaa att ggc atg aaa atc ttt cta Val Leu Tyr His Lys Val Asp Val Glu Ile Gly Met Lys Ile Phe Leu 155 160 165	534
act cct gaa agg cgc agt ttg ttt gaa agg agc ttt ttg ttt ttt gtt Thr Pro Glu Arg Arg Ser Leu Phe Glu Arg Ser Phe Leu Phe Phe Val 170 175 180	582
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Lys Asn Asp Trp Ala Tyr Ser Arg Tyr Tyr Phe Phe Ile Asp Tyr Gly
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Tyr Gly Val Gly Gly Asp Phe Met Val Ala Tyr Ala Lys Asn Pro Ile
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                                    90
Asn Arg Trp Ala Phe Phe Gly Leu Gln Leu Ala Ala Asn Thr Trp
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            100
Ile Leu Asn Asn Lys Val Lys Asp Leu Val Val Asn Thr Trp Asp Ser
                           120
                                                125
Leu Lys Asp Phe Asn Phe His Asn Thr Tyr Phe Arg Ala Ile Gly Lys
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                                           140
Phe Gly Val Gln Phe Arg Thr Ile Val Leu Tyr His Lys Val Asp Val
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Glu Ile Gly Met Lys Ile Phe Leu Thr Pro Glu Arg Arg Ser Leu Phe
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Phe Val Glu Gly Pro Ser Asp Lys Val Phe Leu Glu Val Tyr Leu Tyr
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Phe Leu Glu Arg Phe Pro Ile Lys Asn Phe Lys Val Gln Asn Val Asp
gga aaa gat aac ctg tct aaa cga ttg ctt gaa att gaa aaa tac gat
                                                                      198
Gly Lys Asp Asn Leu Ser Lys Arg Leu Leu Glu Ile Glu Lys Tyr Asp
aaa aca ctt atc att ttt gat gcg gat aaa gac tat gag agt aat aaa
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Lys Thr Leu Ile Ile Phe Asp Ala Asp Lys Asp Tyr Glu Ser Asn Lys
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gaa Glu	caa Gln 90	att Ile	ttt Phe	tta Leu	ttt Phe	cct Pro 95	aat Asn	aat Asn	caa Gln	gat Asp	gat Asp 100	ggc Gly	gat Asp	tta Leu	gaa Glu	342
acc Thr 105	cta Leu	tta Leu	tta Leu	aag Lys	att Ile 110	gct Ala	aac Asn	cac His	aaa Lys	gag Glu 115	ttc Phe	ata Ile	aat Asn	tgt Cys	ttt Phe 120	390
gaa Glu	agc Ser	tat Tyr	ttg Leu	gat Asp 125	tgt Cys	att Ile	aaa Lys	aag Lys	aaa Lys 130	gaa Glu	cat His	tac Tyr	aaa Lys	ccg Pro 135	att Ile	438
aaa Lys	aac Asn	ata Ile	aga Arg 140	aaa Lys	agt Ser	aag Lys	tgg Trp	tat Tyr 145	gcc Ala	tat Tyr	tta Leu	gaa Glu	gcg Ala 150	ctt Leu	gga Gly	486
tta Leu	gaa Glu	aaa Lys 155	ttt Phe	ttc Phe	caa Gln	tac Tyr	aca Thr 160	tgg Trp	gac Asp	aca Thr	aag Lys	aaa Lys 165	aag Lys	aat Asn	aat Asn	534
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ctt Leu	aac Asn	tca Ser	aaa Lys	tct Ser 205	ctt Leu	att Ile	ccc Pro	ctt Leu	aaa Lys 210	aat Asn	ttt Phe	tta Leu	ggg Gly	caa Gln 215	ttt Phe	678
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Asp	50 Lys	Asp	Tyr	Glu	Ser	55 Asn	Lys	Lys	Glu	Ile	60 Leu	Lys	Ile	Val	Ser	

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His Lys Glu Phe Ile Asn Cys Phe Glu Ser Tyr Leu Asp Cys Ile Lys
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Lys Lys Glu His Tyr Lys Pro Ile Lys Asn Ile Arg Lys Ser Lys Trp
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Tyr Ala Tyr Leu Glu Ala Leu Gly Leu Glu Lys Phe Phe Gln Tyr Thr
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Trp Asp Thr Lys Lys Lys Asn Asn Lys Lys Leu Ile Ile Asp Asp
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Lys Asp Gly Asp Glu Ile Glu Ile Lys Asp Gln Tyr Lys Gly Asp Tyr
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           180
Glu Glu Leu Lys Lys Val Leu Asp Leu Asn Ser Lys Ser Leu Ile Pro
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Val Trp Asp Gly Asn Thr Ala Ser Ser Asn Ala Leu Arg Gln Ala Gln
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Ile Asp Val Ile Ala Ala Tyr Pro Ile Thr Pro Ser Thr Pro Ile Val
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Gln Asn Tyr Gly Ser Phe Lys Asp Asn Gly Tyr Val Asp Gly Glu Phe
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gtt tta gtg gaa tct gag cat gcc gcc atg agc gca tgc gtg gga gct
Val Leu Val Glu Ser Glu His Ala Ala Met Ser Ala Cys Val Gly Ala
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gcc gca gct gga ggg aga gtc agc act gcg act agc tct caa ggt ttg
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Ala Ala Gly Gly Arg Val Ser Thr Ala Thr Ser Ser Gln Gly Leu
                 80
gcg tta atg gta gag gtt tta tac cag gct tct gga atg cgt ttg cct
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Ala Leu Met Val Glu Val Leu Tyr Gln Ala Ser Gly Met Arg Leu Pro
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1118

325

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Gly	Thr	Met	Gly 335	Ala	Met	Phe	Asn	Glu 340	Val	Thr	Ser	Ala	Val 345	Tyr	Gln	
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	gaa Glu 365															1214
	aat Asn															1262
	gta Val		_					-	-			taaa	aaag	gaa		1308
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	His	Ala	Ala	Met			Cys	Val	Gly			Ala	Ala	Gly		
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Val	Leu	Tyr		85 Ala	Ser	Gly	Met	-	90 Leu	Pro	Ile	Val		95 Asn	Leu	
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Met Arg Lys Lys Gly Ile Lys Ala Gly Val Ala Thr Ile His Ser Leu
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Leu Gly Ser Ile Gln His Asn Ser Ser Asn Leu Asn Leu Ser Gln Gln
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													tat Tyr 190			576
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		tac Tyr 275											taag	gcgai	cag	865
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Phe Asn Lys Ser Gln Ile Ile Phe Ser Asp Ser Leu Ser Pro Val Phe
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Leu Phe Tyr Asp Leu Ser Ala Ser Leu Tyr Gly Gln Lys Glu Ser Gln
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Ala Tyr Asn Gly Asp Lys Phe Phe Ala Gly Phe Asn Leu Gly Ile Ala
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Phe Leu Val Asn Leu Gly Val Arg Leu Gly Asn Lys His Asn Gln Phe
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Gly Phe Gly Ile Lys Ile Pro Thr Tyr Tyr Phe Asn His Tyr Tyr Ser
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Leu Ser Ala Ala Ser Tyr Pro Pro Ile Lys Asn Thr Lys Val Gly Leu
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Ala Leu Ser Ser His Pro Leu Ala Ser Glu Ile Gly Gln Lys Val Leu
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65

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			gcg gac agg tgg Ala Asp Arg Trp	
	l Thr Tyr Thi		tct tat gga agc Ser Tyr Gly Ser 405	
agt att gat gg Ser Ile Asp Gl 410	g gca gga tti y Ala Gly Phe	tta ttg aac Leu Leu Asn 415	e aat gaa atg gat Asn Glu Met Asp 420	gat ttt 1303 Asp Phe
		Asn Leu Tyr	ggt tta gta ggg Gly Leu Val Gly 435	
			tta agc tcc atg Leu Ser Ser Met 450	
Thr Ile Val Le	u Lys Asn Ası	n Lys Val Phe	ttg gtg gtg gga Leu Val Val Gly	Ser Pro
	g Ile Ile Thi		g caa gtg att tct 1 Gln Val Ile Ser 485	Asn Val
			g gtt tca gcc cca a Val Ser Ala Pro 500	
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Pro Ala Ile Lys Leu Ala Glu Asn Gly Tyr Ala Ile Ser Gln Arg Gln
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Gly Tyr Lys Ile Ile Ser Met Ser Pro Pro Ser Ser Gly Gly Thr His
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Pro Gly Met Gly Gln Leu His Glu Gly Ser Asn Thr Thr His Tyr Ser
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Val Ala Asp Arg Trp Gly Asn Ala Val Ser Val Thr Tyr Thr Ile Asn
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Ala Ser Tyr Gly Ser Ala Ala Ser Ile Asp Gly Ala Gly Phe Leu Leu
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Tyr Gly Leu Val Gly Gly Asp Ala Asn Ala Ile Glu Ala Asn Lys Arg
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Asp Ser Asn Ile Ser Lys Glu Pro Leu Glu Phe Ile Ile Gly Thr Asn
caa atc ata gca ggg tta gaa aag gcg gta tta aag gct caa att ggc
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Gln Ile Ile Ala Gly Leu Glu Lys Ala Val Leu Lys Ala Gln Ile Gly
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gaa Glu	tta Leu	gaa Glu 95	aaa Lys	ggc Gly	atg Met	agc Ser	gtt Val 100	ttt Phe	ggg ggg	caa Gln	act Thr	gaa Glu 105	gac Asp	aat Asn	caa Gln	399
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                                                                      144
Arg Lys Phe Lys Glu Arg Ser Ile Ile Ser Val Cys Glu Ile Ser Asn
cca gta gcg cac aaa ggg ctt aaa agg atc aaa aac cct aac acc att
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Pro Val Ala His Lys Gly Leu Lys Arg Ile Lys Asn Pro Asn Thr Ile
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Leu Thr Thr Asn Ile His Gln Leu Pro Lys Pro Ile Ala Thr Arg Leu
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Phe Asn Ser Ser Ser Asn Thr Gly Ile Cys Ala Cys Asn Cys Ser Phe
age get tge ttt tea ttt tgt aat tge tte gea aac get tea aac tet
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1120

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	ctc Leu															1216
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90

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	130					135					140				Arg	
Ile 145		Lys	Met	Gly	Asp 150		Asp	) Asn	Phe	Trp 155	o Gln	. Met	. Gly	Asp	Ser 160	
Gly	Pro	Cys	Gly	Pro 165	Cys	Ser	Glu	ı Ile	Tyr 170	Ile	e Asp	Glr	Gly	Glu 175	Lys	
His	Phe	. Lys		Ser		. Asp	туг		Gly		/ Glu	ı Gly	7 Asp	Arg	Phe Phe	
Leu	Glu	ı Ile	180 Trp	) Asn	Leu	ı Val				туз	r Glu	Arg	s Ser		ı Asp	
Gly	. Val	195 Leu	. Ser	r Pro	Leu	ı Pro	200 Lys		Ser	: Ile	e Asp	205 Thi		/ Met	Gly	
Leu	210 Glu	) ı Arg	, Val	L Glr	n Ala	215 Let		ı Glu	ı His	Ly:	220 Leu		n Asr	n Phe	e Asp	
		-														

225			_		230					235					240
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			Ala 260					265					270		
His	Ala	Arg 275	Ala	Val	Ala	Phe	Leu 280	Leu	Ala	Gln	Gly	Val 285	His	Phe	Asn
Lys	Glu 290	Gly	Arg	Gly	Tyr	Val 295	Leu	Arg	Arg	Ile	Leu 300	Arg	Arg	Ala	Leu
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Val	Gly	Val	Val	Сув 325	Glu	Gln	Phe	Ala	Asn 330	Thr	His	Ala	Tyr	Leu 335	Lys
Glu	Ser	Lys	Glu 340	Met	Val	Val	Lys	Glu 345	Cys	Phe	Glu	Glu	Glu 350	Glu	His
Phe	Leu	Glu 355	Thr	Leu	Glu	Ser	Gly 360	Met	Glu	Leu	Phe	Asn 365	Leu	Ser	Leu
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			Val 420		_			425					430		
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			580					585					590		Lys
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	610					615					620				Asn
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				645					650					655	Cys
			660					665					670		Ile
		675					680					685			Val
Cys	Gly 690	Lys	Ala	Phe	Tyr	Gln 695	Leu	Ala	ГЛЗ	GLu	Glu 700	Asn	гля	GLu	Leu

705			Lys		710					715					720	
Asn			Lys	725					730					133		
			Pro 740					745					/50			
		755	Gln				760					765				
	770		Arg			775					780					
785			Ala		790					795					800	
Trp			Glu	805					810					8T2		
			Ala 820					825					830		Ala	
Ala	Leu	Asn 835	Leu	Ala	Lys	Asn	Thr 840	Ala	Leu	Lys	Ala	Leu 845	Glu	GТХ		
	<: <:		720 DNA Hel:	icoba	acte	r py]	lori									
			CDS (10	0)	. (63	5)										
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gca	cacg gaaa ata	cca gcg	aaga tagg	atcto cat	ca ta	agcga acc	aata agg	a ggg	gctta gtg	atc :	atg Met 1 ttg	ttt Phe aaa	aat Asn tat	aaa Lys ttg	gtg Val 5 cct Pro	
gca att Ile	cacg gaaa atg Met	cca gcg gta Val	aaga tagg ggg Gly	cgt Arg 10	ttg Leu act	agega ace Thr	agg Arg ata	a ggg aat Asn ggt	gtg Val 15 tta	gag Glu	atg Met 1 ttg Leu aca	Phe aaa Lys agc	aat Asn tat Tyr agg	aaa Lys ttg Leu 20 cgt	gtg Val 5 cct Pro	114
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att Ile agc Ser aaa Lys	atg gaaa atg Met Gly aaa Lys	gta yal tcg Ser caa Gln 40 ttt	ggg Gly gct Ala 25 gac Asp	cgt Arg 10 gcg Ala ggc Gly	ttg Leu gct Ala acg Thr	acc Thr aca Thr cta Leu	agg Arg ata Ile ggc Gly 45 gaa Glu	a ggg aat Asn ggt Gly 30 gaa Glu	gtg Val 15 tta Leu gag Glu	gag Glu gcc Ala gtg Val	atg Met  1  ttg Leu  aca Thr  tgc Cys	aaaa Lys agc Ser ttt Phe 50 tat	tat Tyr agg Arg 35	ttg Leu 20 cgt Arg	gtg Val 5 cct Pro ttt Phe	114 162 210
att Ile agc Ser aaa Lys	atg Met ggt Gly aaa Lys ttg Leu 55	gta yal tcg Ser caa Gln 40 tttt	ggg Gly gct Ala 25 gac Asp	cgt Arg 10 gcg Ala ggc Gly	ttg Leu gct Ala acg Thr	acc Thr aca Thr cta Leu gct Ala 60	agg Arg ata Ile ggc Gly 45 gaa Glu	a ggg aat Asn ggt 30 gaa Glu atc	gtg Val 15 tta Leu gag Glu gct Ala	gag Glu gcc Ala gtg Val aac	atg Met  1  ttg Leu  aca Thr  tgc Cys cag Gln 65 tat	aaaa Lys agc Ser ttt Phe 50 tat Tyr	tat Tyr agg Arg 35 ata Ile	ttg Leu 20 cgt Arg Arg sagat	cct Pro  ttt Phe gcg Ala	114 162 210 258
att Ile agc Ser aaaa Lys cgt Arg	atg Met Gly aaa Lys ttg teu 55	gta yal tcg Ser caa Gln 40 tttt Phe	ggg Gly gct Ala 25 Asp Gggg Gly	cgt Arg 10 gcg Ala ggc Gly cga Arg	ttg Leu gct Ala acg Thr acg Thr ata Lys	acc Thr aca Thr cta Leu gct Ala 60 gaa	agg Arg ata Ile ggc Gly 45 gaa Glu	a ggg aat Asn ggt 30 gaa Glu atc	gtg Val 15 tta Leu gag Glu gct Ala ttg	gag Glu gcc Ala gtg Val aac Asn act Thr	atg Met  1  ttg Leu  aca Thr  tgc Cys  cag Gln  65 tat Tyr	aaaa Lys agc Ser ttt Phe 50 tat Tyr gag	tat Tyr agg 35 ata Ile	ttg Leu 20 cgt Arg Asp ago Ser Trr	cct Pro  ttt Phe  gcg Ala  Lys atg Met 85	114 162 210 258

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cat His	aac Asn 135	gct Ala	ccc Pro	agc Ser	caa Gln	gat Asp 140	cct Pro	ttt Phe	aac Asn	caa Gln	gct Ala 145	tat Tyr	gcg Ala	caa Gln	aac Asn	546
gct Ala 150	tac Tyr	gct Ala	aaa Lys	gag Glu	aat Asn 155	tta Leu	caa Gln	gca Ala	cag Gln	ccg Pro 160	tcc Ser	aag Lys	tat Tyr	caa Gln	aac Asn 165	594
agc Ser	gtg Val	cct Pro	gaa Glu	atc Ile 170	aat Asn	att Ile	gat Asp	gaa Glu	gaa Glu 175	gaa Glu	atc Ile	ccc Pro	ttt Phe			636
	gggtt cacto						atgga	a aaq	gaaaa	acgc	tati	caa	aac g	gcta	ttgcaa	696 720
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Cys		35 Ile	Asp	Ala	Arg		40 Phe	Gly	Arg	Thr	Ala 60		Ile	Ala	Asn	
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Ile	Thr				Leu	Gln	Phe	Met	90 Asp	Lys	Lys	Ser	Asp	Asn	Pro	
Gln	Ala	Asn		Met	Gln		Ser					Asn	Ser		Asn	
Ala	Tyr	115 Pro	Ala	Asn	His	Asn	120 Ala		Ser	Gln	Asp	125 Pro		Asn	Gln	
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145					150					155					160	
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ttt gga aat ccc att aag Phe Gly Asn Pro Ile Lys 10	cat tcc aaa His Ser Lys 15	tcg ccc tta ato Ser Pro Leu Ilo 20	c cat aac gct e His Asn Ala	162
tgt ttt tta act ttt caa Cys Phe Leu Thr Phe Gln 25 30	aaa gaa tta Lys Glu Leu	agg ttt ttg gg Arg Phe Leu Gl 35	g cat tac cac y His Tyr His 40	210
ccc ata tta ctc cct tta Pro Ile Leu Leu Pro Leu 45	gaa agc cac Glu Ser His	atc aaa agc ga Ile Lys Ser Gl 50	g ttt ttg cat u Phe Leu His 55	258
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ttt caa gtt tgc gat aaa Phe Gln Val Cys Asp Lys 75	atc aaa ggt Ile Lys Gly 80	atc gcg ctt ga Ile Ala Leu Gl 8	u Cys Gly Ala	354
gtc aat acg ctt gtt tta Val Asn Thr Leu Val Leu 90	gaa aat gat Glu Asn Asp 95	gag ctt gtg gg Glu Leu Val Gl 100	t tac aat acc y Tyr Asn Thr	402
gac gct tta ggg ttt tat Asp Ala Leu Gly Phe Tyr 105 110	Leu Ser Leu	aag caa aaa aa Lys Gln Lys As 115	c tat caa aac n Tyr Gln Asn 120	450
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gga ttg gat ttt ttc caa Gly Leu Asp Phe Phe Gln 155	cgc ctg ggc Arg Leu Gly 160	tgt gat tgt tt Cys Asp Cys Ph 16	ne Met Glu Pro	594
cct aaa agc gct ttt gat Pro Lys Ser Ala Phe Asr 170	ttg att att Leu Ile Ile 175	aac gcc act to Asn Ala Thr Se 180	a gcg agt ttg er Ala Ser Leu	642
cat aac gaa ttg cct ttg His Asn Glu Leu Pro Leu 185 190	ı Asn Lys Glu	gtt ttg aaa gg Val Leu Lys Gl 195	gg tat ttt aaa Ly Tyr Phe Lys 200	690
gag ggc aag ctc gct tat Glu Gly Lys Leu Ala Tyr	t gat ttg gcg c Asp Leu Ala	tat ggg ttt tt Tyr Gly Phe Le	eu Thr Pro Phe	738

205 210 215

786 ttg tct tta gcc aaa gag tta aaa acc cct ttt caa gac gga aaa gac Leu Ser Leu Ala Lys Glu Leu Lys Thr Pro Phe Gln Asp Gly Lys Asp 225 atg ctc atc tat caa gct gct tta agt ttt gaa aaa ttc agc gct tct 834 Met Leu Ile Tyr Gln Ala Ala Leu Ser Phe Glu Lys Phe Ser Ala Ser 240 879 caa atc cct tat tca aaa gcg ttt gaa gtc atg cga agt gtt ttt Gln Ile Pro Tyr Ser Lys Ala Phe Glu Val Met Arg Ser Val Phe 260 255 tgatgcaagg gtttttaaga agcctgtttt ttggggttaa aaagatccct aaaccattcg 939 990 ctcctctagt agaaaagggc gttttaaaag aagcgcttga attgaaaaag g

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145 150 155 160

Cly Cys Asp Cys Phe Met Glu Pro Pro Lys Ser Ala Phe Asp Leu Ile

165 170 175

Ile Asn Ala Thr Ser Ala Ser Leu His Asn Glu Leu Pro Leu Asn Lys

180 185 190
Glu Val Leu Lys Gly Tyr Phe Lys Glu Gly Lys Leu Ala Tyr Asp Leu
195 200 205

Ala Tyr Gly Phe Leu Thr Pro Phe Leu Ser Leu Ala Lys Glu Leu Lys 210 215 220

Thr Pro Phe Gln Asp Gly Lys Asp Met Leu Ile Tyr Gln Ala Ala Leu 225 230 235 240

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tcg gct tta Ser Ala Leu 20	a gga ggc 1 Gly Gly	ttt gcc Phe Ala 25	act t Thr T	at a Tyr I	itt ga :le Gl <sup>.</sup> 3	u Arg	aaa Lys	gtg Val	tta Leu	gcc Ala 35	151
tat ttc caa Tyr Phe Gli	a cgc cgt n Arg Arg 40	tta ggg Leu Gly	cct t Pro C	igt t Cys T	at gt Yr Va 45	l Gly a aaa	cct Pro	ttt Phe	ggg Gly 50	ctt Leu	199
ttg caa gto Leu Gln Va	c gca gca L Ala Ala 55	gac ggc Asp Gly	att a Ile I	aag c Lys I 60	ett tt Leu Ph	c act e Thr	aaa Lys	gaa Glu 65	gac Asp	att Ile	247
atc cct caa Ile Pro Gli 7	n Gly Ala	aac aaa Asn Lys	ttc a Phe 1 75	att t Ile F	tc ac Phe Th	g cta r Leu	gcg Ala 80	ccc Pro	att Ile	att Ile	295
gcg atg gtg Ala Met Va 85	g agt gcg l Ser Ala	ttt gtg Phe Val 90	tcc a Ser N	atg g Met A	gcg cc Ala Pr	t atc o Ile 95	ccc Pro	ttt Phe	ttc Phe	cct Pro	343
aat ttc ac Asn Phe Th 100	t ctg ttt r Leu Phe	ggc tat Gly Tyr 105	gag a Glu I	atc a Ile I	aag cc Lys Pr 11	o Leu	att Ile	tct Ser	gac Asp	atc Ile 115	391
aac att gg Asn Ile Gl	c ttt ttg y Phe Leu 120	ttt ttc Phe Phe	tta ( Leu <i>l</i>	Ala V	gtg gg Val Gl 125	t tcg y Ser	gca Ala	ggg Gly	att Ile 130	tat Tyr	439
gcg cct at Ala Pro Il	t tta gcc e Leu Ala 135	ggg ctt Gly Leu	Ala :	tct a Ser A 140	aat aa Asn As	c aaa n Lys	tac Tyr	tct Ser 145	tta Leu	att Ile	487
ggc tcc gc Gly Ser Al 15	a Arg Ala	acg atc	caa d Gln 1 155	ctg ( Leu I	ctc ag Leu Se	c ttt r Phe	gaa Glu 160	gtg Val	gtc Val	agc Ser	535
act tta ac Thr Leu Th 165	c att cta r Ile Leu	gcc ccc Ala Pro 170	Leu :	atg ( Met <sup>7</sup>	gtg gt Val Va	a gga al Gly 175	tcg Ser	ctc Leu	tct Ser	tta Leu	583
gtg gaa at Val Glu Il	c aat cat e Asn His	tac caa Tyr Glr	agc Ser	ggt ( Gly (	ggg tt Gly Pl	t tta ne Leu	gac Asp	tgg Trp	ctt Leu	gtg Val	631

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Ser			100					105			_		110	_		
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_	130	Tyr	Ala			135					140					
	Leu	Ile	Gly	Ser		Arg	Ala	Thr	Ile	Gln	Leu	Leu	Ser	Phe	Glu 160	
145 Val	Val	Ser	Thr	Leu 165	150 Thr	Ile	Leu	Ala	Pro 170	155 Leu	Met	Val	Val	Gly 175		
			Val 180	Glu				185	Gln				190	Leu		
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Ser	Tyr 210	Ala	Glu	Leu	Asn	Arg 215		Pro	Phe	Asp	Leu 220	Leu	Glu	His	Glu	
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Gly			Phe	245					250					255		
			Ile 260					265					270			
		275	Ile				280					285				
	290	Trp	Val			295					300					
Met 305	Asp	Met	Сув	Trp	Lys 310	Ile	Met	Leu	Pro	Leu 315	Ala	Leu	Leu	Asn	Ile 320	
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aaa Lys	<pre>&lt; color color</pre>	212> 213> 220> 221> 222> 400> aaa	DNA Hel CDS (48 171 atca	icob ) agcg ggg	(122 at t gag Glu	agcc ttt Phe 10	cgaa gga Gly	. ggg	agt Ser gcg	ttt Phe	gtt Val 15 gat	tcg Ser	Met 1 gag Glu	Asn ttg Leu ttg	tta Leu aaa	
aaa Lys gtg Val 20	<pre> &lt;</pre>	212> 213> 220> 221> 222> 400> aaa tat Tyr	DNA Hel  CDS (48 171 atca	icob ) agcg ggg Gly aga Arg	(122 at t gag Glu 25 aaaa Lys	agcc ttt Phe 10 tta Leu	cgaa gga Gly gaa Glu	ggg Gly cag Gln	agt Ser gcg Ala	ttt Phe ttt Phe 30	gtt Val 15 gat Asp	tcg Ser gcg Ala	Met  1 gag Glu tgt Cys	Asn ttg Leu ttg	tta Leu aaa Lys 35 gtg Val	104

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cat His	aag Lys 85	act Thr	aat Asn	caa Gln	gcc Ala	tta Leu 90	ggg Gly	caa Gln	gcc Ala	ctt Leu	tta Leu 95	gcg Ala	aaa Lys	aaa Lys	atg Met	344
ggt Gly 100	aaa Lys	aca Thr	agg Arg	atc Ile	atc Ile 105	gct Ala	gaa Glu	aca Thr	ggc Gly	gcc Ala 110	ggt Gly	cag Gln	cat His	ggc Gly	gtg Val 115	392
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ctt Leu	aaa Lys 165	Asp	gct Ala	gtg Val	aat Asn	gaa Glu 170	gcc Ala	tta Leu	aga Arg	gat Asp	tgg Trp 175	gcg Ala	agc Ser	agt Ser	tac Tyr	584
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tgc Cys	gtt Val	gga Gly 230	Gly	ggg	tct Ser	aac Asn	gct Ala 235	Ile	ggg	ata Ile	ttc Phe	agc Ser 240	Ala	ttt Phe	tta Leu	776
aac Asn	gac Asp 245	Lys	gaa Glu	gtt Val	aaa Lys	ctc Leu 250	Ile	ggc Gly	gta Val	gag Glu	ccg Pro 255	о Ата	ggt Gly	tta Leu	ggg	824
cta Leu 260	Glu	a aco	aat Asn	aag Lys	cat His 265	Gly	gcg Ala	act Thr	ttg Leu	aat Asr 270	і ГА	g gly	cgt Arg	gtg Val	ggg Gly 275	872
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295 300 305	
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gcc tta aag ctc gct caa aaa tgc gaa gaa gaa agc atc atc gta gtg Ala Leu Lys Leu Ala Gln Lys Cys Glu Glu Glu Ser Ile Ile Val Val 360 365 370	1160
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205
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Glu Val Lys Ser Gln Ile Leu Glu Lys Glu Asn Arg Leu Pro Asp Tyr
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Val Ile Ala Cys Val Gly Gly Gly Ser Asn Ala Ile Gly Ile Phe Ser
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Pro Gly Val Gly Pro Glu His Ser Tyr Leu Lys Glu Ser Gly Arg Ala
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Val Tyr Glu Ser Ala Ser Asp Ala Glu Ala Leu Glu Ala Phe Lys Leu
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Leu Cys Gln Lys Glu Gly Ile Ile Pro Ala Leu Glu Ser Ser His Ala
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Leu Ala Tyr Ala Leu Lys Leu Ala Gln Lys Cys Glu Glu Glu Ser Ile
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gat tgg gaa tat caa tgg gca gtg gct cta gtc tat acg ata tgt atc
Asp Trp Glu Tyr Gln Trp Ala Val Ala Leu Val Tyr Thr Ile Cys Ile
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Ser Ile Asn Ala Arg Ile Phe Tyr Asp Ile Asp Gly Ser Ala Ser Asp
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                                                                       198
 Ser Ile Phe Asp Pro Lys Asn Ser Tyr Tyr Met Trp Leu Val Gly Leu
 ata gcg gct ttg ttg tct aac ctt tta ttt gac cca cga ggt agg gat
                                                                       246
 Ile Ala Ala Leu Leu Ser Asn Leu Leu Phe Asp Pro Arg Gly Arg Asp
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 tgt tat aaa tct ttc caa gta aga tac cct agg ttt ctc aaa gcc att
 Cys Tyr Lys Ser Phe Gln Val Arg Tyr Pro Arg Phe Leu Lys Ala Ile
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agg Arg 105	cta Leu	agg Arg	gat Asp	ttt Phe	tat Tyr 110	gtg Val	atg Met	ctt Leu	tta Leu	acg Thr 115	ata Ile	ccc Pro	ttt Phe	att Ile	gcc Ala 120	390
gct Ala	atc Ile	cat His	gag Glu	gtt Val 125	tcg Ser	gcg Ala	tat Tyr	tac Tyr	ggg Gly 130	cat His	cct Pro	agc Ser	aac Asn	ttc Phe 135	ctt Leu	438
ata Ile	gag Glu	ggt Gly	ttg Leu 140	gtc Val	att Ile	ctt Leu	ggc Gly	ctt Leu 145	gtg Val	tgt Cys	gtt Val	ttt Phe	ggg Gly 150	att Ile	tgt Cys	486
				gct Ala					tgat	tttaa	act (	caaai	tagca	at		533
taaa	atgga	agg (	aaaa	agtaa	aa aa	aatta	a									559
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Ala	Leu	Val	Tyr 20	Thr	Ile	Cys	Ile	Ser 25	Ile	Asn	Ala	Arg	Ile 30	Phe	Tyr	
Asp	Ile	Asp 35		Ser	Ala	Ser	Asp 40		Ile	Phe	Asp	Pro 45	Lys	Asn	Ser	
Tyr	Tyr 50		Trp	Leu	Val	Gly 55		Ile	Ala	Ala	Leu 60		Ser	Asn	Leu	
		Asp	Pro	Arg			Asp	Cys	Tyr	Lys 75		Phe	Gln	Val	Arg 80	
65 Tyr	Pro	Arg	Phe		70 Lys	Ala	Ile	Phe	Lys 90		Arg	Phe	Phe	Gly 95	Ala	
Phe	Tyr	Asn		85 Val	Leu	Gly	Ser			Arg	Asp	Phe			Met	
Leu	Leu			Pro	Phe	Ile		105 Ala	Ile	His	Glu			Ala	Tyr	
Tyr				Ser	Asn			Ile	Glu	Gly	Leu 140			Leu	Gly	
Leu 145 Trp	130 Val	Cys	Val	Phe	Gly 150			Ser	Arg	Leu 155	Cys		Lys	Leu	Gly 160	
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tgc gtg ttt tta acc atc act aac att ctt gtc aaa ggc tcg ttt atc  Cys Val Phe Leu Thr Ile Thr Asn Ile Leu Val Lys Gly Ser Phe Ile  20 25 30	54
aat ctt tta gca ggg ctt agt ggg gtt ttg tat gcg ttt ttt gcc gga 20 Asn Leu Leu Ala Gly Leu Ser Gly Val Leu Tyr Ala Phe Phe Ala Gly 35 40 45 50	)2
gaa agg caa acg att tgc ttt gtg ttt ggt ctt gtt tat aat ttg agt 25 Glu Arg Gln Thr Ile Cys Phe Val Phe Gly Leu Val Tyr Asn Leu Ser 55 60 65	50
tac gct tat gtc gct tat cag tgg aaa tta aac gct gat gtg att tta 29  Tyr Ala Tyr Val Ala Tyr Gln Trp Lys Leu Asn Ala Asp Val Ile Leu  70 75 80	98
tgc ctt ttt ttg tat atg cca gta acg att tat ggg ctg ttc gca tgg  Cys Leu Phe Leu Tyr Met Pro Val Thr Ile Tyr Gly Leu Phe Ala Trp  85  90  95	46
aaa aag aca gag cag cat gaa ggc gtt atc aag gct caa aaa ctt tcc Lys Lys Thr Glu Gln His Glu Gly Val Ile Lys Ala Gln Lys Leu Ser 100 105 110	94
aaa aat tgg cgt ttt ata ctc att tta ggc gta ggg gtt tta act tgt Lys Asn Trp Arg Phe Ile Leu Ile Leu Gly Val Gly Val Leu Thr Cys 115 120 125 130	42
gtg agc gct ttg ttt ttt aaa gag att aaa acg aat ttt tta tgg gca Val Ser Ala Leu Phe Phe Lys Glu Ile Lys Thr Asn Phe Leu Trp Ala 135 140 145	90
gag agt ttt aat ttc gtc atc ttt att att gct ttt att tta cag gtt Glu Ser Phe Asn Phe Val Ile Phe Ile Ile Ala Phe Ile Leu Gln Val 150 155 160	38
ttg cgc tat ata gaa aat tat gcg cta gta act ttg ggg aat atc gta 58 Leu Arg Tyr Ile Glu Asn Tyr Ala Leu Val Thr Leu Gly Asn Ile Val 165 170 175	86
tcc att atc gtg tgg ttt tgt att ttt caa att tct aca gag agc ttg Ser Ile Ile Val Trp Phe Cys Ile Phe Gln Ile Ser Thr Glu Ser Leu 180 185 190	34
gtg caa ctc ttc aca acg atc cta tac ctt ttt att ggc ttg tat tat Val Gln Leu Phe Thr Thr Ile Leu Tyr Leu Phe Ile Gly Leu Tyr Tyr 195 200 205 210	82

Phe Asn Arg Trp Asn Lys Ser Cys Lys Gln 215 220	732
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Ala Gly Glu Arg Gln Thr Ile Cys Phe Val Phe Gly Leu Val Tyr Asn 50 55 60	
Leu Ser Tyr Ala Tyr Val Ala Tyr Gln Trp Lys Leu Asn Ala Asp Val 65 70 75 80	
Ile Leu Cys Leu Phe Leu Tyr Met Pro Val Thr Ile Tyr Gly Leu Phe 85 90 95	
Ala Trp Lys Lys Thr Glu Gln His Glu Gly Val Ile Lys Ala Gln Lys 100 105 110	
Leu Ser Lys Asn Trp Arg Phe Ile Leu Ile Leu Gly Val Gly Val Leu 115 120 125	
Thr Cys Val Ser Ala Leu Phe Phe Lys Glu Ile Lys Thr Asn Phe Leu	
Trp Ala Glu Ser Phe Asn Phe Val Ile Phe Ile Ile Ala Phe Ile Leu	
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165 170 175  Ile Val Ser Ile Ile Val Trp Phe Cys Ile Phe Gln Ile Ser Thr Glu	
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gcg Ala	tta Leu 20	Leu	aag Lys	aat Asn	tta Leu	gcg Ala 25	atc Ile	gct Ala	ttg Leu	att Ile	gag Glu 30	cat His	aac Asn	aaa Lys	att Ile	152
gaa Glu 35	Thr	ggg ggg	att Ile	tat Tyr	aag Lys 40	gct Ala	aag Lys	gaa Glu	ttg Leu	cgc Arg 45	agt Ser	tac Tyr	att Ile	gag Glu	aaa Lys 50	200
ttg Leu	acg Thr	aca Thr	gcg Ala	gct Ala 55	cgt Arg	gtg Val	ggc Gly	gat Asp	ttt Phe 60	aat Asn	gcg Ala	cac His	cgc Arg	cat His 65	gtt Val	248
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atc Ile	gcg Ala	ccc Pro 85	aaa Lys	tac Tyr	gcg Ala	caa Gln	agg Arg 90	aat Asn	ggc Gly	gga Gly	tac Tyr	acc Thr 95	agg Arg	atc Ile	caa Gln	344
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Lys	Ile	Glu 35	Thr	Gly	Ile	Tyr	Lys 40		Lys	Glu	Leu	Arg 45		Tyr	Ile	
Glu	Lys 50		Thr	Thr	Ala	Ala 55		Val	Gly	Asp	Phe		Ala	His	Arg	
His 65		Phe	Ala	Tyr	Leu 70		Asn	Lys	Glu	Ala 75		His	Lys	Leu		
	Glu	Ile	Ala	Pro 85		Tyr	Ala	Gln	Arg 90		Gly	Gly	Tyr		80 Arg	
Ile	Gln	Arg	Thr 100		Phe	Arg	Arg	Gly 105		Ala	Ser	Thr	Leu 110	95 Ala	Thr	
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tct tac aga aag ctg gct tta aaa tac cac cca gac aga aac gcc ggc Ser Tyr Arg Lys Leu Ala Leu Lys Tyr His Pro Asp Arg Asn Ala Gly 25 30 35	149
gat aaa gaa gcc gaa gaa aaa ttc aag ctc atc aat gaa gcc tat ggg Asp Lys Glu Ala Glu Glu Lys Phe Lys Leu Ile Asn Glu Ala Tyr Gly 40 45 50	197
gtg tta agc gat gaa aag aag cgg gcc tta tac gac agg tat ggt aaa Val Leu Ser Asp Glu Lys Lys Arg Ala Leu Tyr Asp Arg Tyr Gly Lys 55 60 65 70	245
aaa ggc tta aac caa gcc ggc gca agc caa ggc gat ttt tct gat ttt Lys Gly Leu Asn Gln Ala Gly Ala Ser Gln Gly Asp Phe Ser Asp Phe 75 80 85	293
ttt gaa gat tta ggc tcg ttt ttt gaa gac gct ttt ggg ttt ggc gct Phe Glu Asp Leu Gly Ser Phe Phe Glu Asp Ala Phe Gly Phe Gly Ala 90 95 100	341
agg ggg agt aaa agg caa aaa agc tct atc gca ccg gat tat ttg caa Arg Gly Ser Lys Arg Gln Lys Ser Ser Ile Ala Pro Asp Tyr Leu Gln 105 110 115	389
acc ctt gaa ttg agt ttc aaa gaa gcg gtt ttt ggc tgt aaa aaa acc Thr Leu Glu Leu Ser Phe Lys Glu Ala Val Phe Gly Cys Lys Lys Thr 120 125 130	437
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gct aaa gac aaa gcc cta gag act tgc aag caa tgc aat ggg cag ggg Ala Lys Asp Lys Ala Leu Glu Thr Cys Lys Gln Cys Asn Gly Gln Gly 155 160 165	533
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gcg tgt caa ggc aag ggc aag atc gtt aaa acc cca tgc caa gcg tgc Ala Cys Gln Gly Lys Gly Lys Ile Val Lys Thr Pro Cys Gln Ala Cys 185 190 195	629
aag ggt aaa acc tat atc ctt aaa gat gaa gaa att gat gcg ata atc Lys Gly Lys Thr Tyr Ile Leu Lys Asp Glu Glu Ile Asp Ala Ile Ile	677

205 210 200 725 cct gag ggc att gat gat caa aac cgc atg gtg ctt aaa aat aaa ggc Pro Glu Gly Ile Asp Asp Gln Asn Arg Met Val Leu Lys Asn Lys Gly 220 225 aat gaa tac gag aag gga aaa aga ggg gat ttg tat tta gaa gcg caa 773 Asn Glu Tyr Glu Lys Gly Lys Arg Gly Asp Leu Tyr Leu Glu Ala Gln 240 gtc aaa gaa gat gag cat ttc aag cgc gaa ggc tgc gat tta ttc att 821 Val Lys Glu Asp Glu His Phe Lys Arg Glu Gly Cys Asp Leu Phe Ile 255 869 aaa gcg ccg gtg ttt ttc acc act atc gct tta ggg cat acg att aaa Lys Ala Pro Val Phe Phe Thr Thr Ile Ala Leu Gly His Thr Ile Lys 270 917 gtg ccg tct tta aaa ggg gac gaa ctg gaa tta aaa atc cct aga aac Val Pro Ser Leu Lys Gly Asp Glu Leu Glu Leu Lys Ile Pro Arg Asn 285 965 gcc aga gac aag cag act ttt gcg ttt aga aac gag ggc gtg aaa cac Ala Arg Asp Lys Gln Thr Phe Ala Phe Arg Asn Glu Gly Val Lys His 300 305 cct gaa agc tct tat aga ggg agt ttg atc gtg gaa ttg caa gtg att 1013 Pro Glu Ser Ser Tyr Arg Gly Ser Leu Ile Val Glu Leu Gln Val Ile 315 320 1061 tac cct aaa agt ttg aat aaa gag cag caa gaa ttg ttg gaa aaa ttg Tyr Pro Lys Ser Leu Asn Lys Glu Gln Glu Leu Leu Glu Lys Leu 335 1109 cat gcg agt ttt ggc tat gag ggc gag ccg cat aaa agc gtt tta gaa His Ala Ser Phe Gly Tyr Glu Gly Glu Pro His Lys Ser Val Leu Glu 350 acc tgt att tct aaa att aaa gac tgg ttc aaa taaaaggttg ttgatgcatg 1162 Thr Cys Ile Ser Lys Ile Lys Asp Trp Phe Lys 1204 agtttctaaa agcttttaaa gacgctttcc ctcataccat tt <210> 180 <211> 369 <212> PRT <213> Helicobacter pylori <400> 180 Val Glu Leu Ser Tyr Tyr Glu Ile Leu Glu Val Glu Lys His Ser Asn 10 Gln Glu Thr Ile Lys Lys Ser Tyr Arg Lys Leu Ala Leu Lys Tyr His 25 Pro Asp Arg Asn Ala Gly Asp Lys Glu Ala Glu Glu Lys Phe Lys Leu 40 45 Ile Asn Glu Ala Tyr Gly Val Leu Ser Asp Glu Lys Lys Arg Ala Leu

Tyr Asp Arg Tyr Gly Lys Lys Gly Leu Asn Gln Ala Gly Ala Ser Gln

60

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Gln Cys Asn Gly Gln Gly Gln Val Phe Met Arg Gln Gly Phe Met Ser
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Thr Pro Cys Gln Ala Cys Lys Gly Lys Thr Tyr Ile Leu Lys Asp Glu
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Leu Lys Ile Pro Arg Asn Ala Arg Asp Lys Gln Thr Phe Ala Phe Arg
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Asn Glu Gly Val Lys His Pro Glu Ser Ser Tyr Arg Gly Ser Leu Ile
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Val Glu Leu Gln Val Ile Tyr Pro Lys Ser Leu Asn Lys Glu Gln Gln
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Glu Leu Leu Glu Lys Leu His Ala Ser Phe Gly Tyr Glu Gly Glu Pro
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                                                                       98
acg caa atc gcg ctc cct aac agc cac cct tta ttg aaa aaa gtt tta
Thr Gln Ile Ala Leu Pro Asn Ser His Pro Leu Leu Lys Lys Val Leu
     15
                                                                      146
aac tac gcc aaa aag cat ttc agc cag tgc cac atg ctc tct tca tcg
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Asn 30	Tyr	Ala	Lys	Lys	His 35	Phe	Ser	Gln	Cys	His 40	Met	Leu	Ser	Ser	Ser 45	
tta Leu	ctc Leu	atc Ile	tta Leu	aac Asn 50	gac Asp	acg Thr	gaa Glu	tgc Cys	ttt Phe 55	aaa Lys	aaa Lys	aac Asn	tac Tyr	ttg Leu 60	ctt Leu	194
aat Asn	tgg Trp	gtc Val	tat Tyr 65	cat His	gcc Ala	ctt Leu	gaa Glu	tgc Cys 70	gtg Val	cat His	gaa Glu	aaa Lys	gat Asp 75	att Ile	agc Ser	242
gcg Ala	cat His	tct Ser 80	tta Leu	gaa Glu	gag Glu	gtt Val	tta Leu 85	caa Gln	aaa Lys	agc Ser	cac His	ctg Leu 90	ccc Pro	ata Ile	cgc Arg	290
atc Ile	aaa Lys 95	atc Ile	atg Met	gct Ala	caa Gln	aac Asn 100	acg Thr	ctt Leu	tta Leu	gaa Glu	aag Lys 105	ata Ile	gaa Glu	gtg Val	aaa Lys	338
gtt Val 110	tta Leu	acc Thr	ttt Phe	ggg Gly	gcg Ala 115	gaa Glu	tat Tyr	gcg Ala	ctt Leu	ttt Phe 120	atc Ile	acc Thr	aaa Lys	cac His	cct Pro 125	386
atc Ile	gcc Ala	aag Lys	cgg Arg	ttt Phe 130	tta Leu	cgc Arg	caa Gln	aaa Lys	ttt Phe 135	agc Ser	ggc Gly	tgt Cys	gtg Val	ttt Phe 140	tta Leu	434
gaa Glu	acc Thr	caa Gln	gat Asp 145	gaa Glu	ttg Leu	cat His	ata Ile	aga Arg 150	ggc Gly	gat Asp	tca Ser	gag Glu	cgt Arg 155	ttt Phe	tgg Trp	482
gaa Glu	ctc Leu	att Ile 160	gta Val	acg Thr	ctc Leu	aat Asn	gaa Glu 165	aat Asn	aga Arg	atc Ile	gtc Val	cat His 170	aac Asn	gca Ala	tgc Cys	530
tta Leu	gat Asp 175	ttc Phe	atc Ile	tac Tyr	cct Pro	aat Asn 180	ggc Gly	ttt Phe	ggc Gly	aag Lys	gac Asp 185	agc Ser	tac Tyr	acc Thr	act Thr	578
Met	Ala	Glu	Arg	Lys	tta Leu 195	Lys	Glu	Cys	Tyr	Lys	Thr	cta Leu	Gly	ttt Phe	atc Ile 205	626
aag Lys	cat His	gaa Glu	gat Asp	ttc Phe 210	agc Ser	gaa Glu	gtc Val	aaa Lys	aag Lys 215	Arg	tat Tyr	tta Leu	gaa Glu	ttg Leu 220	gct Ala	674
aaa Lys	acc Thr	tac Tyr	cac His 225	Pro	gat Asp	tta Leu	tgc Cys	gat Asp 230	Leu	aaa Lys	gaa Glu	aaa Lys	aag Lys 235	gct Ala	ctt Leu	722
tat Tyr	gcc Ala	aaa Lys 240	Arg	ttc Phe	gct Ala	atc Ile	att Ile 245	Gln	gag Glu	gcg Ala	tat Tyr	cgc Arg 250	His	att Ile	aaa Lys	770
	cac His 255	Ala		accc	cta	aact	agcc	ct a	atcg	eget	a g					810

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Ala Leu Pro Asn Ser His Pro Leu Leu Lys Lys Val Leu Asn Tyr Ala
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                                                    3.0
         20
Lys Lys His Phe Ser Gln Cys His Met Leu Ser Ser Ser Leu Leu Ile
                            40
Leu Asn Asp Thr Glu Cys Phe Lys Lys Asn Tyr Leu Leu Asn Trp Val
                                            60
                        55
Tyr His Ala Leu Glu Cys Val His Glu Lys Asp Ile Ser Ala His Ser
                                        75
                    70
Leu Glu Glu Val Leu Gln Lys Ser His Leu Pro Ile Arg Ile Lys Ile
                                    90
                85
Met Ala Gln Asn Thr Leu Leu Glu Lys Ile Glu Val Lys Val Leu Thr
                                                    110
                               105
Phe Gly Ala Glu Tyr Ala Leu Phe Ile Thr Lys His Pro Ile Ala Lys
                                                125
                           120
Arg Phe Leu Arg Gln Lys Phe Ser Gly Cys Val Phe Leu Glu Thr Gln
                                            140
                        135
Asp Glu Leu His Ile Arg Gly Asp Ser Glu Arg Phe Trp Glu Leu Ile
                    150
                                        155
Val Thr Leu Asn Glu Asn Arg Ile Val His Asn Ala Cys Leu Asp Phe
                                    170
                                                       175
Ile Tyr Pro Asn Gly Phe Gly Lys Asp Ser Tyr Thr Thr Met Ala Glu
                                185
Arg Lys Leu Lys Glu Cys Tyr Lys Thr Leu Gly Phe Ile Lys His Glu
                            200
                                                205
Asp Phe Ser Glu Val Lys Lys Arg Tyr Leu Glu Leu Ala Lys Thr Tyr
                        215
                                            220
His Pro Asp Leu Cys Asp Leu Lys Glu Lys Lys Ala Leu Tyr Ala Lys
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                                       235
Arg Phe Ala Ile Ile Gln Glu Ala Tyr Arg His Ile Lys Lys His Ala
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atg aag tca aat aaa aag tcc aat cgt tta aga gcg att tat aga gct
                                                                      106
Met Lys Ser Asn Lys Lys Ser Asn Arg Leu Arg Ala Ile Tyr Arg Ala
                                                                      154
tta gtg atc gct ata gga cta gct gtt atc atc gtt ttc aat tac ttt
Leu Val Ile Ala Ile Gly Leu Ala Val Ile Ile Val Phe Asn Tyr Phe
                                  25
                                                                      202
aac cgc aaa aac aat aac gcc cgc tcc agc cgt agg gct tgt tcg tgc
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Asn	Arg	Lys 35	Asn	Asn	Asn	Ala	Arg 40	Ser	Ser	Arg	Arg	Ala 45	Cys	Ser	Cys	
ttt Phe	ttt Phe 50	tcc Ser	ctt Leu	acc Thr	ggg Gly	gtt Val 55	aat Asn	tta Leu	gaa Glu	aaa Lys	ata Ile 60	ggc Gly	act Thr	ttt Phe	gat Asp	250
acg Thr 65	gac Asp	gct Ala	aaa Lys	ctc Leu	att Ile 70	gtc Val	tta Leu	aac Asn	cac His	caa Gln 75	agc Ser	tta Leu	cta Leu	gac Asp	atc Ile 80	298
att Ile	tat Tyr	tta Leu	gaa Glu	gcc Ala 85	tac Tyr	cac His	cct Pro	aga Arg	aat Asn 90	att Ile	tgc Cys	tgg Trp	atc Ile	gct Ala 95	aaa Lys	346
aaa Lys	gag Glu	ctg Leu	ggc Gly 100	gaa Glu	atc Ile	cct Pro	ttt Phe	tat Tyr 105	Gly ggg	cat His	gcc Ala	tta Leu	acg Thr 110	gat Asp	acc Thr	394
gga Gly	atg Met	att Ile 115	tta Leu	att Ile	gac Asp	aga Arg	gag Glu 120	gat Asp	aaa Lys	aag Lys	ggg Gly	att Ile 125	gtg Val	agc Ser	ctt Leu	442
ttg Leu	aaa Lys 130	gcg Ala	tgt Cys	aaa Lys	gaa Glu	aaa Lys 135	tta Leu	gac Asp	caa Gln	aac Asn	cgc Arg 140	cct Pro	tta Leu	gtg Val	att Ile	490
ttc Phe 145	cct Pro	gaa Glu	ggc Gly	act Thr	aga Arg 150	ggc Gly	aaa Lys	gga Gly	gga Gly	gaa Glu 155	aaa Lys	ttc Phe	ctc Leu	cct Pro	ttc Phe 160	538
aag Lys	caa Gln	ggg Gly	gct Ala	aaa Lys 165	atc Ile	atc Ile	gcc Ala	gaa Glu	aaa Lys 170	ttc Phe	cag Gln	ctc Leu	aaa Lys	atc Ile 175	caa Gln	586
ccc Pro	atg Met	gtg Val	tta Leu 180	atc Ile	aat Asn	tcc Ser	att Ile	aaa Lys 185	atc Ile	ttt Phe	aat Asn	tcc Ser	aag Lys 190	cct Pro	cta Leu	634
gaa Glu	gcc Ala	tat Tyr 195	aaa Lys	gcg Ala	cgc Arg	Thr	cgt Arg 200	Leu	gtc Val	atg Met	cta Leu	gaa Glu 205	Ser	tat Tyr	acg Thr	682
cct Pro	gat Asp 210	Phe	aac Asn	tcg Ser	ccc Pro	acc Thr 215	tgg Trp	tat Tyr	gaa Glu	gaa Glu	tta Leu 220	caa Gln	gaa Glu	cgc Arg	atg Met	730
caa Gln 225	Lys	gag Glu	tat Tyr	tta Leu	aaa Lys 230	cac His	tat Tyr	cat His	gaa Glu	tta Leu 235	Asn	cct Pro	agc Ser	gaa Glu	caa Gln 240	778
tga tta aa	agct aaaa	ttt gcc	tgac ttat	tacg tttt	ct c ta g	cttt aaat	gagt agaa	t tg a aa	gctt cgct	ggcg acct	gga aga	gttt agcc	ttg cta	caaa aaaa	gcgaat tcccta	838 898 900

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Leu Val Ile Ala Ile Gly Leu Ala Val Ile Ile Val Phe Asn Tyr Phe
                                25
Asn Arg Lys Asn Asn Asn Ala Arg Ser Ser Arg Arg Ala Cys Ser Cys
                            40
Phe Phe Ser Leu Thr Gly Val Asn Leu Glu Lys Ile Gly Thr Phe Asp
                        55
                                            60
Thr Asp Ala Lys Leu Ile Val Leu Asn His Gln Ser Leu Leu Asp Ile
                                        75
Ile Tyr Leu Glu Ala Tyr His Pro Arg Asn Ile Cys Trp Ile Ala Lys
                85
                                    90
Lys Glu Leu Gly Glu Ile Pro Phe Tyr Gly His Ala Leu Thr Asp Thr
                                                    110
                                105
            100
Gly Met Ile Leu Ile Asp Arg Glu Asp Lys Lys Gly Ile Val Ser Leu
                           120
Leu Lys Ala Cys Lys Glu Lys Leu Asp Gln Asn Arg Pro Leu Val Ile
                                            140
                       135
Phe Pro Glu Gly Thr Arg Gly Lys Gly Glu Lys Phe Leu Pro Phe
                                        155
                    150
Lys Gln Gly Ala Lys Ile Ile Ala Glu Lys Phe Gln Leu Lys Ile Gln
                                    170
                165
Pro Met Val Leu Ile Asn Ser Ile Lys Ile Phe Asn Ser Lys Pro Leu
                                                    190
                               185
Glu Ala Tyr Lys Ala Arg Thr Arg Leu Val Met Leu Glu Ser Tyr Thr
                                                205
                           200
Pro Asp Phe Asn Ser Pro Thr Trp Tyr Glu Glu Leu Gln Glu Arg Met
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Gln Lys Glu Tyr Leu Lys His Tyr His Glu Leu Asn Pro Ser Glu Gln
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                                           Met Glu Ile Arg Thr
                                                                      102
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Phe Leu Glu Arg Ala Leu Lys Glu Asp Leu Gly His Gly Asp Leu Phe
gaa agg gtg tta gaa aaa gat ttt aag gcc aca gcg ttt gtt agg gct
                                                                      150
Glu Arg Val Leu Glu Lys Asp Phe Lys Ala Thr Ala Phe Val Arg Ala
                                 30
                                                                      198
aaa caa gag ggc gtg ttt tca ggc gaa aaa tac gct tta gag ttg ttg
Lys Gln Glu Gly Val Phe Ser Gly Glu Lys Tyr Ala Leu Glu Leu Leu
                                                                      246
gaa atg acc ggc att gaa tgc gtt caa acg att aag gat aaa gaa cgc
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Glu	Met 55	Thr	Gly	Ile	Glu	Cys 60	Val	Gln	Thr	Ile	Lys 65	Asp	Lys	Glu	Arg	
ttc Phe 70	aag Lys	cct Pro	aaa Lys	gac Asp	gct Ala 75	tta Leu	atg Met	gaa Glu	att Ile	agg Arg 80	Gly ggg	gat Asp	ttt Phe	agc Ser	atg Met 85	294
ctt Leu	tta Leu	aag Lys	gtt Val	gag Glu 90	cgc Arg	acc Thr	ctt Leu	tta Leu	aac Asn 95	ctt Leu	ttg Leu	caa Gln	cac His	agc Ser 100	agc Ser	342
GJÀ aaa	att Ile	gct Ala	act Thr 105	tta Leu	acg Thr	agc Ser	cgt Arg	ttt Phe 110	gta Val	gag Glu	gct Ala	tta Leu	aat Asn 115	tct Ser	cat His	390
aaa Lys	gtg Val	cgt Arg 120	ttg Leu	ttg Leu	gac Asp	acg Thr	aga Arg 125	aaa Lys	acg Thr	aga Arg	ccc Pro	ctt Leu 130	tta Leu	agg Arg	atc Ile	438
ttt Phe	gaa Glu 135	aaa Lys	tat Tyr	tcc Ser	gtg Val	ctt Leu 140	aat Asn	ggg Gly	gga Gly	gcg Ala	agc Ser 145	aac Asn	cac His	cgc Arg	tta Leu	486
ggg Gly 150	cta Leu	gat Asp	gac Asp	gct Ala	tta Leu 155	atg Met	ctt Leu	aaa Lys	gac Asp	acg Thr 160	cat His	tta Leu	agg Arg	cat His	gtg Val 165	534
aaa Lys	gat Asp	ctc Leu	aaa Lys	agc Ser 170	ttt Phe	tta Leu	acg Thr	cat His	gcc Ala 175	aga Arg	aaa Lys	aac Asn	ttg Leu	cct Pro 180	ttc Phe	582
acg Thr	gct Ala	aaa Lys	att Ile 185	gaa Glu	att Ile	gaa Glu	tgc Cys	gaa Glu 190	agc Ser	ttt Phe	gaa Glu	gag Glu	gcc Ala 195	aaa Lys	aac Asn	630
gcc Ala	atg Met	aat Asn 200	gcg Ala	gga Gly	gcg Ala	gat Asp	att Ile 205	gtg Val	atg Met	tgc Cys	gat Asp	aat Asn 210	Leu	agc Ser	gtt Val	678
tta Leu	gag Glu 215	Thr	Lys	Glu	att Ile	Ala	Ala	Tyr	Arg	Asp	Ala	cat His	tat Tyr	ccc Pro	ttt Phe	726
gtt Val 230	Leu	ctg Leu	gaa Glu	gcg Ala	agc Ser 235	Gly ggg	aac Asn	att Ile	tca Ser	cta Leu 240	Glu	agc Ser	att Ile	aac Asn	gct Ala 245	774
tac Tyr	gct Ala	aaa Lys	agc Ser	ggc Gly 250	gtg Val	gat Asp	gcc Ala	att Ile	agc Ser 255	Val	Gly	gct Ala	tta Leu	atc Ile 260	cat His	822
	gcc Ala			Ile									agac	ttt		868
aaa aaa at	aagg agaa	ggt tga	tatt actc	aaca acgc	tg c ac c	taaa gccc	agaa ttct	t at t ta	ttag taca	aaag .actt	cat gct	taaa taat	gat cag	ctta ttaa	cgcctg aaaacc	928 988 990

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                            40
Ala Leu Glu Leu Leu Glu Met Thr Gly Ile Glu Cys Val Gln Thr Ile
                        55
Lys Asp Lys Glu Arg Phe Lys Pro Lys Asp Ala Leu Met Glu Ile Arg
                                        75
                    70
Gly Asp Phe Ser Met Leu Leu Lys Val Glu Arg Thr Leu Leu Asn Leu
                                    90
                85
Leu Gln His Ser Ser Gly Ile Ala Thr Leu Thr Ser Arg Phe Val Glu
                                                     110
                                105
Ala Leu Asn Ser His Lys Val Arg Leu Leu Asp Thr Arg Lys Thr Arg
                                                125
                            120
Pro Leu Leu Arg Ile Phe Glu Lys Tyr Ser Val Leu Asn Gly Gly Ala
                        135
                                            140
Ser Asn His Arg Leu Gly Leu Asp Asp Ala Leu Met Leu Lys Asp Thr
                    150
                                        155
His Leu Arg His Val Lys Asp Leu Lys Ser Phe Leu Thr His Ala Arg
                                    170
                                                         175
                165
Lys Asn Leu Pro Phe Thr Ala Lys Ile Glu Ile Glu Cys Glu Ser Phe
                                185
            180
Glu Glu Ala Lys Asn Ala Met Asn Ala Gly Ala Asp Ile Val Met Cys
                            200
                                                 205
Asp Asn Leu Ser Val Leu Glu Thr Lys Glu Ile Ala Ala Tyr Arg Asp
                                             220
                        215
    210
Ala His Tyr Pro Phe Val Leu Leu Glu Ala Ser Gly Asn Ile Ser Leu
                                         235
                    230
225
Glu Ser Ile Asn Ala Tyr Ala Lys Ser Gly Val Asp Ala Ile Ser Val
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                                                                       104
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Lys Ile Ser Leu Asn Ser Asn Lys Arg Ala Trp Met Trp Trp Phe Gln
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5 10 15

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tac Tyr 35	aga Arg	atg Met	tca Ser	gac Asp	aat Asn 40	ctc Leu	ttg Leu	cat His	aaa Lys	gac Asp 45	atc Ile	caa Gln	gcc Ala	cta Leu	atc Ile 50	200
gct Ala	cgc Arg	tta Leu	aag Lys	cgc Arg 55	cag Gln	gac Asp	tta Leu	agc Ser	ttg Leu 60	ggc Gly	atg Met	cta Leu	gaa Glu	aaa Lys 65	tcg Ser	248
ctc Leu	tct Ser	cgc Arg	ctt Leu 70	att Ile	cat His	gat Asp	gaa Glu	atc Ile 75	aat Asn	ttg Leu	gag Glu	tat Tyr	ttg Leu 80	aag Lys	gcg Ala	296
tgc Cys	ggg Gly	ctc Leu 85	aat Asn	ttc Phe	ata Ile	gaa Glu	acg Thr 90	agc Ser	gaa Glu	aat Asn	tta Leu	atc Ile 95	acg Thr	ctc Leu	aaa Lys	344
aac Asn	ctt Leu 100	aaa Lys	acc Thr	ccc Pro	ctt Leu	aaa Lys 105	gat Asp	gag Glu	gtt Val	ttt Phe	tcc Ser 110	ttt Phe	att Ile	gat Asp	tta Leu	392
gaa Glu 115	acc Thr	acc Thr	gga Gly	tct Ser	tgc Cys 120	ccc Pro	ata Ile	aag Lys	cat His	gag Glu 125	att Ile	tta Leu	gaa Glu	att Ile	ggg Gly 130	440
gcc Ala	gtg Val	caa Gln	gtg Val	aaa Lys 135	Gly ggg	Gly	gaa Glu	att Ile	atc Ile 140	aat Asn	cgt Arg	ttt Phe	gaa Glu	acc Thr 145	ctt Leu	488
gtg Val	aaa Lys	gtc Val	aaa Lys 150	agc Ser	gtg Val	cct Pro	gat Asp	tat Tyr 155	atc Ile	gct Ala	gag Glu	ctt Leu	aca Thr 160	ggc Gly	atc Ile	536
act Thr	tat Tyr	gaa Glu 165	gac Asp	acc Thr	cta Leu	aac Asn	gcc Ala 170	Pro	agc Ser	gcg Ala	cat His	gaa Glu 175	gct Ala	ttg Leu	caa Gln	584
gaa Glu	ttg Leu 180	cgg Arg	ctt Leu	ttt Phe	tta Leu	ggc Gly 185	aat Asn	agc Ser	gtg Val	ttt Phe	gtg Val 190	Ala	cac His	aac Asn	gct Ala	632
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tgc Cys	cct Pro	tta Leu	ttg Leu	aat Asn 215	Leu	aag Lys	ctt Leu	tgc Cys	act Thr 220	Leu	gat Asp	tta Leu	tcc Ser	aaa Lys 225	cga Arg	728
gcc Ala	att Ile	ttg Leu	tcc Ser 230	Met	cgt Arg	tat Tyr	tct Ser	ttg Leu 235	. Ser	ttt Phe	tta Leu	aaa Lys	gag Glu 240	ı Lev	tta Leu	776
ggg	ttt	ggt	ata	gaa	gtc	agc	cat	aga	gcc	tat	geg	gac	gct	tta	gcg	824

Gly	Phe	Gly 245	Ile	Glu	Val	Ser	His 250	Arg	Ala	Tyr	Ala	Asp 255	Ala	Leu	Ala	
agc Ser	tat Tyr 260	aaa Lys	ctc Leu	ttt Phe	gaa Glu	ata Ile 265	tgc Cys	ctg Leu	tta Leu	aac Asn	ttg Leu 270	ccc Pro	agc Ser	tac Tyr	atc Ile	872
aaa Lys 275	acg Thr	aca Thr	atg Met	gat Asp	ttg Leu 280	att Ile	gat Asp	ttt Phe	tct Ser	aaa Lys 285	tgt Cys	gct Ala	aac Asn	acg Thr	cta Leu 290	920
atc Ile	aaa Lys	aga Arg	ccc Pro	cca Pro 295	aaa Lys	gcc Ala	aga Arg	tac Tyr	caa Gln 300	gag Glu	att Ile	cca Pro	tcg Ser	cca Pro 305	ttt Phe	968
tct Ser	ctt Leu	ttt Phe	gaa Glu 310	aag Lys	aca Thr	aag Lys	ggc Gly	ttg Leu 315	ttc Phe	aat Asn	cat His	aaa Lys	agc Ser 320	aac Asn	cag Gln	1016
tta Leu	aac Asn	gaa Glu 325	agc Ser	tgt Cys	tta Leu	atg Met	ggg Gly 330	ttt Phe	atg Met	Gly ggg	act Thr	gaa Glu 335	att Ile	tta Leu	gca Ala	1064
tct Ser	cta Leu 340	ttt Phe	gat Asp	act Thr	ttt Phe	gaa Glu 345	tgt Cys	tgc Cys	cta Leu	gta Val	ttt Phe 350	tgai	ttt	atc		1110
ggt	tacti	tcg (	cacto	catc	gt a	tatc	tttt:	t gt	attc	tgt	atg					1153
	<: <: <:	210> 211> 212> 213>	350 PRT Hel:	icob	acte:	r py:	lori									
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1 Phe Lys Leu	<: <: <: Ile Gln	211> 212> 213> 400> Lys Gly Tyr 35 Ala	350 PRT Hel: 188 Ile Val 20 Arg	Ser 5 Ile Met Leu	Leu Phe Ser Lys	Asn Leu Asp Arg	Ser Asn Asn 40 Gln	Pro 25 Leu Asp	10 Lys Leu Leu	Ile His Ser	Val Lys Leu 60	Ser Asp 45 Gly	Trp 30 Ile Met	15 Leu Gln Leu	Leu Ala Glu	
1 Phe Lys Leu Lys 65	<pre>&lt;:     <!--     <!</td--><td>211&gt; 212&gt; 213&gt; 400&gt; Lys Gly Tyr 35 Ala</td><td>350 PRT Hel: 188 Ile Val 20 Arg Arg</td><td>Ser 5 Ile Met Leu Arg</td><td>Leu Phe Ser Lys Leu 70</td><td>Asn Leu Asp Arg 55 Ile</td><td>Ser Asn Asn 40 Gln His</td><td>Pro 25 Leu Asp</td><td>10 Lys Leu Leu Glu</td><td>Ile His Ser Ile 75</td><td>Val Lys Leu 60 Asn</td><td>Ser Asp 45 Gly Leu</td><td>Trp 30 Ile Met Glu</td><td>15 Leu Gln Leu Tyr</td><td>Leu Ala Glu Leu 80</td><td></td></pre>	211> 212> 213> 400> Lys Gly Tyr 35 Ala	350 PRT Hel: 188 Ile Val 20 Arg Arg	Ser 5 Ile Met Leu Arg	Leu Phe Ser Lys Leu 70	Asn Leu Asp Arg 55 Ile	Ser Asn Asn 40 Gln His	Pro 25 Leu Asp	10 Lys Leu Leu Glu	Ile His Ser Ile 75	Val Lys Leu 60 Asn	Ser Asp 45 Gly Leu	Trp 30 Ile Met Glu	15 Leu Gln Leu Tyr	Leu Ala Glu Leu 80	
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-		275		Thr			280					285				
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aaa Lys	at.t.															
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Leu gaa	tac Tyr 20	Glu 5 tat Tyr	Ser caa Gln gaa	Asn	Asp ccc Pro	ser atc Ile 25 tta	His 10 tac Tyr	Leu caa Gln gat	Arg cgc Arg	Gly cct Pro	tat Tyr 30	Leu 15 caa Gln aat	Lys tgg Trp	aca Thr	Glu gaa Glu gat	
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gaa Glu 35 gac Asp	tac Tyr 20 aac Asn aga Arg	Glu 5 tat Tyr tgc Cys gaa Glu	caa Gln gaa Glu ggc Gly	atc Ile aaa Lys gat Asp	Asp ccc Pro ctt Leu 40 tat Tyr	ser atc Ile 25 tta Leu ttt Phe aca	His 10 tac Tyr gac Asp tgc Cys	caa Gln gat Asp ggc Gly	cgc Arg ttg Leu tca Ser 60 gat	Gly cct Pro ttt Phe 45 tta Leu	tat Tyr 30 ttt Phe gtc Val	Leu 15 caa Gln aat Asn tta Leu gat	tgg Trp tat Tyr att Ile	aca Thr gaa Glu gca Ala 65 cag	gaa Glu gat Asp 50 atc Ile	153 201

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aac Asn	gat Asp 180	ttc Phe	att Ile	gag Glu	tgg Trp	ctg Leu 185	tat Tyr	tct Ser	aat Asn	gtt Val	aaa Lys 190	ttt Phe	atc Ile	acc Thr	atc Ile	I	633
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Lys Asn Ala Ile Cys Leu Lys Asp Tyr Leu Met Lys Lys Glu Ile Lys
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Glu Leu Leu Lys His Ala Lys Glu His Glu Arg Glu Glu Phe Val Ser
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Lys Leu Phe Glu Tyr Gly Ile Asn Ala Val Val Leu Gly Asp Tyr Leu
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Thr Thr Lys Gly Lys Ala Pro Lys Lys Asp Ile Glu Lys Leu Leu Ser
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                                                                      152
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Val Tyr Glu Asn Glu Lys Phe Phe Ile Gly Tyr Phe Ile Gly Ala Gly
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                         25
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Leu Gly Gly Glu Ser Val Thr Pro Asn Val Leu Lys Asp Phe Gly Asn
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Gly Asp Ala Pro Ser Cys Ser Leu Lys Lys Leu Lys Ser Cys Glu Ser
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cat His 275	Ser	atc Ile	att Ile	gac Asp	agc Ser 280	Ser	gct Ala	tta Leu	gcg Ala	atc Ile 285	Gln	act Thr	aaa Lys	gcc Ala	gga Gly 290	922
acg Thr	atc Ile	atc Ile	cac His	acc Thr 295	Gly	gat Asp	ttt Phe	aaa Lys	atc Ile 300	Asp	cac His	acc Thr	ccg Pro	gtg Val 305	gat Asp	970

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gtg Val	atg Met	ctt Leu 325	ctt Leu	tta Leu	agc Ser	gat Asp	tcc Ser 330	acc Thr	aac Asn	tcc Ser	cat His	aaa Lys 335	tcc Ser	ggg Gly	act Thr	106	6
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gaa Glu 355	gcg Ala	caa Gln	Gly ggg	agg Arg	gtg Val 360	att Ile	atg Met	agc Ser	acc Thr	ttc Phe 365	tct Ser	agc Ser	aat Asn	atc Ile	cac His 370	116	2
cgg Arg	gtc Val	tat Tyr	caa Gln	gcc Ala 375	ata Ile	caa Gln	tac Tyr	ggc Gly	att Ile 380	aaa Lys	tac Tyr	aac Asn	cgc Arg	aag Lys 385	atc Ile	121	0
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ttg Leu	ggc Gly	tat Tyr 405	atc Ile	cat His	ttg Leu	cct Pro	tat Tyr 410	caa Gln	tct Ser	ttt Phe	att Ile	gaa Glu 415	gcc Ala	aat Asn	gaa Glu	130	6
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gtg Val	agc Ser 500	ggg	cat His	gcc Ala	gcc Ala	caa Gln 505	gaa Glu	gag Glu	caa Gln	aag Lys	ctc Leu 510	atg Met	tta Leu	aga Arg	ctc Leu	159	94
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gcg Ala	cgc Arg	cac His	aaa Lys	caa Gln	acc Thr	gct Ala	att Ile	tct Ser	tgc Cys	gga Gly	gtg Val	cct Pro	gaa Glu	aaa Lys	aat Asn	169	90

540 545 535 1738 atc tat tta atg gag gat ggc gat cag gtg gag gtt ggc cct gcg ttc Ile Tyr Leu Met Glu Asp Gly Asp Gln Val Glu Val Gly Pro Ala Phe 550 555 atc aaa aaa gtc ggc acg att aaa agc ggg aaa agc tat gtg gat aac 1786 Ile Lys Lys Val Gly Thr Ile Lys Ser Gly Lys Ser Tyr Val Asp Asn 570 caa agc aat ttg agt att gat aca agc atc gtg caa caa aga gaa gaa 1834 Gln Ser Asn Leu Ser Ile Asp Thr Ser Ile Val Gln Gln Arg Glu Glu 585 gtc gct agc gcc ggg gtg ttt gtg gct acg att ttt gtg aat aaa aac 1882 Val Ala Ser Ala Gly Val Phe Val Ala Thr Ile Phe Val Asn Lys Asn 600 1930 aag caa gcg ctt tta gaa agc tct caa ttt tcc agt tta ggg ctt gtg Lys Gln Ala Leu Leu Glu Ser Ser Gln Phe Ser Ser Leu Gly Leu Val 620 615 ggt ttc aaa gat gaa aag cct ttg atc aaa gaa att caa ggg ggc tta 1978 Gly Phe Lys Asp Glu Lys Pro Leu Ile Lys Glu Ile Gln Gly Gly Leu 630 635 2026 gag gtg tta ttg aaa tcc agc aac gcc gaa att ttg aat aac cct aaa Glu Val Leu Leu Lys Ser Ser Asn Ala Glu Ile Leu Asn Asn Pro Lys 650 2074 aaa tta gaa gat cac act cgt aat ttc atc aga aaa gcg ctc ttt aaa Lys Leu Glu Asp His Thr Arg Asn Phe Ile Arg Lys Ala Leu Phe Lys 665 2119 aag ttt aga aaa tac ccg gct atc att tgt cat gcc cat tct ttt Lys Phe Arg Lys Tyr Pro Ala Ile Ile Cys His Ala His Ser Phe 680 2169 tgattgtaac gctattgctt cacaagtttt aaaagatgaa gcgagcgcgc <210> 196 <211> 689 <212> PRT <213> Helicobacter pylori <400> 196 Met Thr Asp Asn Asn Gln Asn Asn Glu Asn His Glu Asn Ser Ser Glu 5 10 Asn Ser Lys Ala Asp Glu Met Arg Ala Gly Ala Phe Glu Arg Phe Thr 2.0 25 Asn Arg Lys Lys Arg Phe Arg Glu Asn Ala Gln Lys Asn Ala Glu Tyr 40 Ser Asn His Glu Ala Ser Ser His His Lys Lys Glu His Arg Pro Asn 55 Lys Lys Pro Asn Asn His His Lys Gln Lys His Ala Lys Thr Arg Asn 70 75 Tyr Ala Gln Glu Glu Leu Asp Ser Asn Lys Val Glu Gly Val Thr Glu

90

Ile Leu His Val Asn Glu Arg Gly Thr Leu Gly Phe His Lys Glu Leu

			100					105					110		
		115			Ala		120					125			
	130				Asn	135					140				
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		275			Ile		280					285			
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			420		Tyr			425					430		
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		515					520					525			
	530				Lys Met	535					540				
545					550					555					560
Ala	rne	тте	ьуѕ	ьуs 565	Val	σтХ	1111	тте	ьуs 570		ату	пys	Set	575	val

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Glu Glu Val Ala Ser Ala Gly Val Phe Val Ala Thr Ile Phe Val Asn
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Lys Asn Lys Gln Ala Leu Leu Glu Ser Ser Gln Phe Ser Ser Leu Gly
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Leu Val Gly Phe Lys Asp Glu Lys Pro Leu Ile Lys Glu Ile Gln Gly
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Gly Leu Glu Val Leu Leu Lys Ser Ser Asn Ala Glu Ile Leu Asn Asn
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Pro Lys Lys Leu Glu Asp His Thr Arg Asn Phe Ile Arg Lys Ala Leu
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Phe Ser Asn Leu Asn Glu Glu Pro Leu Lys Asn Gln Ile Lys Ala Glu
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                                                                      153
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Phe Phe Lys Asp Lys Lys Phe Leu Tyr Ser Gly Asp Lys Ile Asp Phe
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Met Leu Ser Tyr Lys His Ser Asn Ala Thr Leu Pro Ile Leu Trp Gly
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Glu Ala Lys Arg Gly Asp Phe Asp Asp Leu Asp Lys Ala Phe Thr Gln
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ctt ctt tta acc ata ggc aag cac agg ctt tat acc cac cac aca cca
Leu Leu Thr Ile Gly Lys His Arg Leu Tyr Thr His His Thr Pro
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Pro Tyr Leu Cys Ala Phe Asn Ala Phe Lys Met Glu Phe Ile Ala Phe
 85
                      90
gat gac acg atc aca agc ttt ttt tat aaa agc gat ata gat ttt tct
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Asp Asp Thr Ile Thr Ser Phe Phe Tyr Lys Ser Asp Ile Asp Phe Ser
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110

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acc Thr	caa Gln 150	agc Ser	caa Gln	gaa Glu	tgc Cys	aaa Lys 155	gaa Glu	ttt Phe	atc Ile	aaa Lys	aac Asn 160	cgt Arg	tta Leu	aat Asn	tct Ser	537
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ggt Gly	tta Leu	ttg Leu	aat Asn	aag Lys 345	gct Ala	aat Asn	ttg Leu	tat Tyr	cta Leu 350	tcc Ser	act Thr	tta Leu	gat Asp	cat His 355	aac Asn	1113

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aaa Lys 405	cga Arg	aaa Lys	aag Lys	ctc Leu	atc Ile 410	att Ile	tac Tyr	atc Ile	aac Asn	ccg Pro 415	ccc Pro	tat Tyr	gca Ala	gaa Glu	gca Ala 420	1305
ggt Gly	aat Asn	aaa Lys	tct Ser	aag Lys 425	atg Met	agt Ser	ggc Gly	aca Thr	ggc Gly 430	gaa Glu	cat His	aaa Lys	gcc Ala	aaa Lys 435	gtg Val	1353
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gaa Glu	aac Asn	ccc Pro 535	cta Leu	aat Asn	tta Leu	Gly	ggc Gly 540	aac Asn	tct Ser	aaa Lys	gaa Glu	gag Glu 545	aaa Lys	caa Gln	aac Asn	1689
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tcc Ser	caa Gln	agc Ser	aga Arg	aca Thr	aga Arg	act Thr	aag Lys	ggg Gly	aca Thr	caa Gln	aag Lys	cat His	tct Ser	aca Thr	gca Ala	1833

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590

585

595

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		210					215					220				Arg	
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Lys Ser Lys Gln Ser His Val Lys Tyr Phe Pro Ile Ile Ala Thr Thr
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Ile Leu Leu Val Ser Val Phe Phe Ser Ile Arg His Cys Ile Lys Ala
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Phe				725					730					735		
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	850	Leu				855					860					
Leu 865	Tyr	Ala	Asn	Leu	Gln 870	Asp	Ala	Leu	Lys	Asp 875	Leu	Ala	Lys	Glu	Ile 880	
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gag	ataa	ag at Me	tg ti	ta ga	aa tt	t at ne I	ct ti	ta aa eu Ly	aa at ys I:	tt ca	aa go ln Al	ct a	ga ga	ac to sp Se	et aaa er Lys	111
ggc	ttg	ag at Me	tg ti et Le l agc	ca ga eu Gi acg	aa ti lu Pl att	t at ne II	t ti le Le 5	eu Ly act	ys I: atc	tt ca le Gi gct	aa go ln A	ct ag la A 10 aag	ga ga rg A: ggc	sp Se	er Lys aac	111 159
ggc Gly 15	ttg Leu gtc	ag at Me Stg	et Le l agc Ser	acg Thr	aa tilu Platti att Ile 20	agc Ser	acc Thr	act Thr	atc Ile	tt calle G. gct Ala 25	aa go ln A aac Asn	ct agla Alla Alla Alla Alla Alla Alla Alla	ga ga rg A: ggc Gly cgt	tat Tyr ttt	aac Asn 30	
ggc Gly 15 atc Ile	ttg Leu gtc Val	ag at Me gtg Val aaa	agc ser aac Asn	acg Thr gat Asp 35	aa tilu Pl att Ile 20 gaa Glu caa	agc Ser	acc Thr gtt Val	act Thr gat Asp	atc Ile ccc Pro 40	gct Ala 25 tta Leu	aa goln A aac Asn aaa Lys	ct ag la A: 10  aag Lys  cag Gln  aat	ga ga rg A: ggc Gly cgt Arg	tat Tyr ttt Phe 45	aac Asn 30 ttc Phe	159
ggc Gly 15 atc Ile atg Met	ttg Leu gtc Val cgg Arg	ag a Mo gtg Val aaa Lys	agc ser aac Asn aaa Lys 50	acg Thr gat Asp 35 atc Ile	att Ile 20 gaa Glu caa Gln caa	agc Ser ttt Phe aaa Lys tcc	acc Thr gtt Val gaa Glu	act Thr gat Asp atc Ile 55 aag	atc Ile ccc Pro 40 aag Lys	gct Alaa 25 tta Leu ccc Pro	aac gola aac Asn aaa Lys ttg Leu ctt	ct agla A. 10  aagg Lys  cag Gln  aat Asn	ga ga rg A: ggc Gly cgt Arg act Thr 60 aaa	tat Tyr ttt Phe 45 gaa Glu	aac Asn 30 ttc Phe att Ile	159 207
ggc Gly 15 atc Ile atg Met aaa Lys	ttg Leu gtc Val cgg Arg gag Glu	gtg Val aaa Lys tta Leu caa Gln 65	agc ttet Let Let Let Let Let Let Let Let Le	acg Thr gat Asp 35 atc Ile gag Glu	att Ile 20 gaa Glu caa Gln tta	agc Ser ttt Phe aaa Lys tcc Ser ttg	acc Thr gtt Val gaa Glu ttau 70 att	act Thr gat Asp atc Ile 55 aag Lys	atc Ile ccc Pro 40 aag Lys acc Thr	gct Ala 25 tta Leu ccc Pro gct Ala att	aac Asn aaa Lys ttg Leu ctt Leu tta	ct agla Allo aagg Lys cag Gln aat Asn ttt Phe 75 acg	ga ga rg A: ggc Gly cgt Arg act Thr 60 aaa Lys	tat Tyr ttt Phe 45 gaa Glu gcc Ala	aac Asn 30 ttc Phe att Ile cta Leu aaa	159 207 255

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cct Pro	tat Tyr	ttt Phe 145	tat Tyr	gcg Ala	cct Pro	tgc Cys	gac Asp 150	aat Asn	caa Gln	gtt Val	ttg Leu	cat His 155	gaa Glu	aaa Lys	gaa Glu	543
gtt Val	tta Leu 160	gaa Glu	atc Ile	att Ile	aaa Lys	aac Asn 165	ctg Leu	gaa Glu	tta Leu	aag Lys	cac His 170	aaa Lys	gtg Val	agt Ser	gca Ala	591
gac Asp 175	ttg Leu	ctc Leu	gtt Val	tta Leu	gcc Ala 180	aaa Lys	tac Tyr	atg Met	cgc Arg	att Ile 185	tta Leu	agc Ser	cat His	gat Asp	ttt Phe 190	639
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gtg Val	aaa Lys	gtc Val 225	atc Ile	Gly aaa	gcc Ala	acg Thr	gcg Ala 230	cat His	ttt Phe	gtg Val	aat Asn	gaa Glu 235	agc Ser	ctt Leu	gat Asp	783
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ago Ser 255	gtg Val	gaa Glu	aaa Lys	atg Met	cgc Arg 260	Leu	gcg Ala	ggt Gly	aag Lys	gat Asp 265	ata Ile	gaa Glu	aaa Lys	ctg Leu	gtt Val 270	879
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Gln Glu Glu Gln Ser Leu Lys Thr Ala Leu Phe Lys Ala Leu Glu Asn
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Phe Asn Glu Leu Leu Ile Glu Val Ile Leu Thr His Lys Lys Asn Ile
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Ile Leu Leu Ala Thr Lys Glu Ser His Cys Leu Gly Asp Leu Leu
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Phe Tyr Ala Pro Cys Asp Asn Gln Val Leu His Glu Lys Glu Val Leu
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Glu Ile Ile Lys Asn Leu Glu Leu Lys His Lys Val Ser Ala Asp Leu
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Leu Val Leu Ala Lys Tyr Met Arg Ile Leu Ser His Asp Phe Thr Lys
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Arg Tyr Glu Asn Gln Ile Leu Asn Ile His His Ser Phe Leu Pro Ala
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Val Ile Gly Ala Thr Ala His Phe Val Asn Glu Ser Leu Asp Ala Gly
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Pro Ile Ile Ile Gln Asp Thr Leu Pro Ile Asn His Asn Tyr Ser Val
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Glu Lys Met Arg Leu Ala Gly Lys Asp Ile Glu Lys Leu Val Leu Ala
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Trp His Lys Arg Leu Ala Val Gly Cys Cys Ile Val Leu Phe Ser Cys
atg atg aac gct aat agc att caa atc gtt aga gac gat ccg ccc ctt
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Met Met Asn Ala Asn Ser Ile Gln Ile Val Arg Asp Asp Pro Pro Leu
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tat Tyr	ttt Phe	agc Ser	gat Asp 55	ggg Gly	act Thr	tat Tyr	aaa Lys	gaa Glu 60	ggc Gly	tat Tyr	gcg Ala	act Thr	ttg Leu 65	ctc Leu	aaa Lys	248
aac Asn	Gl <sup>A</sup> aaa	cgt Arg 70	tat Tyr	atc Ile	gct Ala	tct Ser	tct Ser 75	gaa Glu	acg Thr	ctt Leu	tat Tyr	tct Ser 80	aac Asn	ggc Gly	tta Leu	296
tac Tyr	cct Pro 85	aaa Lys	acg Thr	att Ile	tta Leu	gcc Ala 90	aaa Lys	atg Met	caa Gln	gac Asp	agc Ser 95	agc Ser	gct Ala	aaa Lys	gag Glu	344
ctg Leu 100	att Ile	tgt Cys	ata Ile	gct Ala	agc Ser 105	cta Leu	cgc Arg	ctt Leu	gaa Glu	gcg Ala 110	atg Met	gat Asp	agg Arg	aat Asn	caa Gln 115	392
Gly aaa	ctt Leu	tcg Ser	ctt Leu	tta Leu 120	aaa Lys	acc Thr	gcc Ala	gat Asp	ttt Phe 125	aga Arg	gac Asp	gat Asp	tat Tyr	tgc Cys 130	cat His	440
aaa Lys	aga Arg	gaa Glu	gag Glu 135	agc Ser	tat Tyr	tat Tyr	cat His	gca Ala 140	agg Arg	att Ile	tac Tyr	aca Thr	aaa Lys 145	tac Tyr	gct Ala	488
caa Gln	act Thr	ttt Phe 150	cat His	tca Ser	aat Asn	ccc Pro	tat Tyr 155	acc Thr	aat Asn	caa Gln	aaa Lys	aca Thr 160	ccc Pro	aat Asn	tct Ser	536
gat Asp	ctc Leu 165	tac Tyr	tac Tyr	cca Pro	gcg Ala	tta Leu 170	aat Asn	gag Glu	ggg	aat Asn	tct Ser 175	ttt Phe	tct Ser	ata Ile	cag Gln	584
ata Ile 180	atg Met	ggc	att Ile	tct Ser	gtg Val 185	gct Ala	gaa Glu	ctt Leu	ttg Leu	aaa Lys 190	tct Ser	aaa Lys	aaa Lys	ttc Phe	ctt Leu 195	632
tcg Ser	ctt Leu	gat Asp	gtt Val	tct Ser 200	ttt Phe	aaa Lys	aag Lys	Gly aaa	agc Ser 205	gtg Val	ttg Leu	tgg Trp	gga Gly	ggg Gly 210	agg Arg	680
cct Pro	tat Tyr	ttt Phe	agc Ser 215	gaa Glu	gtg Val	GJA aaa	gag Glu	ttt Phe 220	atg Met	gly	atg Met	gct Ala	agc Ser 225	agc Ser	act Thr	728
tta Leu	gaa Glu	aac Asn 230	Gln	gaa Glu	agt Ser	ctg Leu	gtg Val 235	att Ile	atc Ile	cct Pro	aaa Lys	gaa Glu 240	aag Lys	atc Ile	gtg Val	776
caa Gln	ttt Phe 245	Leu	aac Asn	gct Ala	cta Leu	aaa Lys 250	Asn	caa Gln	aat Asn	att Ile	ttc Phe 255	cca Pro	aac Asn	att Ile	ccc Pro	824
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Leu Lys Val Tyr Phe Ser Asp Gly Thr Tyr Lys Glu Gly Tyr Ala Thr
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Leu Leu Lys Asn Gly Arg Tyr Ile Ala Ser Ser Glu Thr Leu Tyr Ser
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Asn Gly Leu Tyr Pro Lys Thr Ile Leu Ala Lys Met Gln Asp Ser Ser
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Ala Lys Glu Leu Ile Cys Ile Ala Ser Leu Arg Leu Glu Ala Met Asp
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Arg Asn Gln Gly Leu Ser Leu Leu Lys Thr Ala Asp Phe Arg Asp Asp
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Lys Tyr Ala Gln Thr Phe His Ser Asn Pro Tyr Thr Asn Gln Lys Thr
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Pro Asn Ser Asp Leu Tyr Tyr Pro Ala Leu Asn Glu Gly Asn Ser Phe
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                                   170
Ser Ile Gln Ile Met Gly Ile Ser Val Ala Glu Leu Leu Lys Ser Lys
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                                                  190
Lys Phe Leu Ser Leu Asp Val Ser Phe Lys Lys Gly Ser Val Leu Trp
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                           200
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                                          220
                       215
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Asp Trp His Ile Gln Lys Val Glu Met Asn His Gln Val Tyr Asp Ile
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gcc aaa gag caa gag caa aaa gaa aaa aga aaa cgc tgg tat g Ala Lys Glu Gln Glu Gln Lys Glu Lys Arg Lys Arg Trp Tyr G 60 65 70	gag ctt 306 Glu Leu
ttt aaa aag aaa cca aag ccc aaa agc tct atg gga gag ttt g Phe Lys Lys Lys Pro Lys Pro Lys Ser Ser Met Gly Glu Phe V 75 80 85	gtg ttt 354 Val Phe
gat caa aaa gaa aat cgt att tat ggc aaa ggc tat tgc aac c Asp Gln Lys Glu Asn Arg Ile Tyr Gly Lys Gly Tyr Cys Asn A 90 95 100	cgg tat 402 Arg Tyr 105
ttt gcc agc tat gta tgg cag ggc gat agg cac att ggg att g Phe Ala Ser Tyr Val Trp Gln Gly Asp Arg His Ile Gly Ile ( 110 115	gaa gat 450 Glu Asp 120
agc ggg att tca aga aaa gtg tgt aaa gat gag cat tta atg g Ser Gly Ile Ser Arg Lys Val Cys Lys Asp Glu His Leu Met 2 125 130 135	gcg ttt 498 Ala Phe
gaa ttg gaa ttt atg gag aat ttt aag ggt aat ttt acg gta a Glu Leu Glu Phe Met Glu Asn Phe Lys Gly Asn Phe Thr Val 1 140 145 150	act aag 546 Thr Lys
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Cys Lys Asp Glu His Leu Met Ala Phe Glu Leu Glu Phe Met Glu Asn
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                        135
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Leu Thr Leu Thr Pro Ile Lys Arg Phe Leu Glu Lys Gly Asn Asn His
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                                                                       154
gag agc tac ggc gat aaa aat ctt ttc act ctc atc agc att agc cct
Glu Ser Tyr Gly Asp Lys Asn Leu Phe Thr Leu Ile Ser Ile Ser Pro
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                                                                       202
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Gly	Ile 210		Val	Pro	Thr	Ile 215		His	Gln	Leu	Phe 220		Leu	Thr	Asn	
Glu 225	Lys	Gly	Tyr	Thr	Leu 230		Ala	Asp	Val	Arg 235		Val	Tyr	Ala	Phe 240	
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aag gtt aaa att tta aaa cca aaa ttt gct ttc aaa agc cct aaa att Lys Val Lys Ile Leu Lys Pro Lys Phe Ala Phe Lys Ser Pro Lys Ile 50 55 60	375
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gcc gaa ctt gag cag tgt cgg ctc gcc gaa ctt cag gct tat tta aaa Ala Glu Leu Glu Gln Cys Arg Leu Ala Glu Leu Gln Ala Tyr Leu Lys 130 135 140	615
gct aca ggg cta gaa aac acc acc ctt tct aac gat gaa gaa aac gcc Ala Thr Gly Leu Glu Asn Thr Thr Leu Ser Asn Asp Glu Glu Asn Ala 145 150 155	663
ctt aat gtt ttc aat aat tct ggg ggg ggg ggt aat acc cca tgc Leu Asn Val Phe Asn Asn Ser Gly Gly Gly Gly Gly Asn Thr Pro Cys 160 165 170	711
ggc tta aca tgg caa agc ttt aga tta ggg gat ttg ttt gaa att gaa Gly Leu Thr Trp Gln Ser Phe Arg Leu Gly Asp Leu Phe Glu Ile Glu 175 180 185	759
aaa acc tta agc ttt aat aaa gac gct tta acg caa gga gaa gat tat	807

Lys	Thr	Leu	Ser	Phe 195	Asn	Lys	Asp	Ala	Leu 200	Thr	Gln	Gly	Glu	Asp 205	Tyr	
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Gly aaa	ctt Leu 240	ttg Leu	caa Gln	atg Met	gat Asp	ttt Phe 245	ttc Phe	tat Tyr	cgt Arg	aaa Lys	aag Lys 250	tca Ser	tgg Trp	tat Tyr	gcg Ala	951
gga Gly 255	caa Gln	ttc Phe	atg Met	cga Arg	aaa Lys 260	atc Ile	aca Thr	cca Pro	aaa Lys	act Thr 265	gaa Glu	att Ile	gaa Glu	aat Asn	aaa Lys 270	999
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agg Arg	gag Glu	caa Gln 305	aaa Lys	atc Ile	caa Gln	cta Leu	ccc Pro 310	cta Leu	aaa Lys	ccc Pro	acc Thr	gct Ala 315	aaa Lys	act Thr	caa Gln	1143
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cta Leu 335	atg Met	aag Lys	caa Gln	acc Thr	att Ile 340	caa Gln	ggc Gly	gtg Val	gct Ala	caa Gln 345	tac Tyr	tgc Cys	gac Asp	gct Ala	aaa Lys 350	1239
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60

120 175

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gat Asp	gat Asp	cat His	ttt Phe	cct Pro 25	aac Asn	gat Asp	ttg Leu	att Ile	gaa Glu 30	atc Ile	atg Met	cat His	ttt Phe	ggg Gly 35	ggt Gly	271
aaa Lys	aat Asn	aga Arg	gcg Ala 40	cga Arg	aag Lys	caa Gln	atc Ile	cct Pro 45	aat Asn	atg Met	cac His	cat His	gcc Ala 50	gat Asp	aat Asn	319
gtt Val	atc Ile	ctt Leu 55	aga Arg	acc Thr	ctt Leu	gca Ala	ata Ile 60	agg Arg	gta Val	gcg Ala	cgt Arg	gaa Glu 65	atg Met	gcc Ala	ttt Phe	367
		atg t gtc a					agct	t gti	tttct	tca	tcca	aaaca	aca d	ccat	gtcttt	427 450
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His	Phe	Gly	20 Gly	Lys	Asn	Arg	Ala 40	25 Arg	Lys	Gln	Ile	Pro 45	30 Asn	Met	His	
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gac Asp	ttt Phe 20	Leu	aag Lys	ctc Leu	att Ile	aat Asn 25	Lys	Gly	gct Ala	att Ile	tgc Cys 30	Gly	gca Ala	acg Thr	agt Ser	152

aac Asn 35	cct Pro	agt Ser	ttg Leu	ttt Phe	tgc Cys 40	gaa Glu	gcg Ala	atc Ile	aca Thr	aaa Lys 45	agc Ser	gcg Ala	ttt Phe	tat Tyr	aaa Lys 50	200
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act Thr	ctg Leu	gcg Ala	tta Leu 70	aag Lys	gat Asp	att Ile	tta Leu	caa Gln 75	gct Ala	tct Ser	agc Ser	gcg Ala	ttg Leu 80	atg Met	cct Pro	296
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cct Pro	gtt Val	aat Asn	gta Val 150	act Thr	tta Leu	gtc Val	ttt Phe	tcg Ser 155	cct Pro	aaa Lys	att Ile	gcc Ala	ggt Gly 160	gaa Glu	atc Ile	536
gct Ala	caa Gln	atc Ile 165	tta Leu	gcc Ala	aaa Lys	gaa Glu	gcg Ala 170	caa Gln	aaa Lys	aga Arg	gcg Ala	gtc Val 175	att Ile	agc Ser	gtg Val	584
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tgt Cys	ttt Phe	aaa Lys 245		tct Ser	atc Ile	aat Asn	aca Thr 250	gcc Ala	cct Pro	cta Leu	gag Glu	gct Ala 255	Leu	aac Asn	gct Ala	824
tat Tyr	ttg Leu	ctt Leu	gac Asp	cca Pro	aac Asn	acc Thr	gag Glu	tgt Cys	caa Gln	acc Thr	cct Pro	tta Leu	aag Lys	act Thr	aca Thr	872

270 265 260 920 gaa att gaa gcg ttt aaa aaa gaa tta aaa gtg cac aac att gat tta Glu Ile Glu Ala Phe Lys Lys Glu Leu Lys Val His Asn Ile Asp Leu 280 gaa aac acc gct caa aaa ctc ctt aaa gaa ggc ttg ata gcg ttc aaa 968 Glu Asn Thr Ala Gln Lys Leu Leu Lys Glu Gly Leu Ile Ala Phe Lys 300 295 caa tcc ttt gaa aag ctt tta agc agt ttt tgatttttaa gggttttttg 1018 Gln Ser Phe Glu Lys Leu Leu Ser Ser Phe 1051 gatagaataa gcccttattt tattttaaag gat

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tta gat att tct aaa aaa ggt tcg gta att tta ggc gct ctt tt Leu Asp Ile Ser Lys Lys Gly Ser Val Ile Leu Gly Ala Leu Le 35 40 45	
tcg tta tgg ctg aca aac ccc tta aat gcc cat gaa aag aat gg Ser Leu Trp Leu Thr Asn Pro Leu Asn Ala His Glu Lys Asn Gl 50 55 60	
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gct aat gat ggc aaa gtt cct gac ggg cag acc ggt ggc tg Ala Asn Asp Asp Gly Lys Val Pro Asp Gly Gln Thr Gly Gly Cy 100 105 110	
cca gct tca ggg acg cca gga acg cca ggc tac act aaa gct aa Pro Ala Ser Gly Thr Pro Gly Thr Pro Gly Tyr Thr Lys Ala As 115 120 125	
gtg gtc aat tgg act tcg cgc acc atg ctt agc acc aat aaa aa Val Val Asn Trp Thr Ser Arg Thr Met Leu Ser Thr Asn Lys As 130 135 140	
cct ggc cgt aac cag ccg atg tat ggg cta ggc gtg atg aca gg Pro Gly Arg Asn Gln Pro Met Tyr Gly Leu Gly Val Met Thr Gl 150 155	ly Tyr
aag cat ttt atc ggt aaa aaa aga tgg ttt ggg ttg cgc tat ta	ac ggc 585

Lys	His	Phe	Ile 165	Gly	Lys	Lys	Arg	Trp 170	Phe	Gly	Leu	Arg	Tyr 175	Tyr	Gly	
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											ata Ile					729
											gcg Ala					777
											tat Tyr					825
											gat Asp					873
											ggg Gly 285					921
											gtg Val					969
											aat Asn					1017
	Gly	Ile	Glu	Phe	Gly	Ile	Lys	Ile	Pro	Thr	ctc Leu	Pro	Asn	Tyr		1065
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Asn Ala Tyr Lys Asn Gly Glu Leu Phe Gln Val Pro Phe Gly Asp Val
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Ser Ala Asn Asp Asp Gly Lys Val Pro Asp Gly Gln Thr Gly Gly Cys
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Gln Pro Ala Ser Gly Thr Pro Gly Thr Pro Gly Tyr Thr Lys Ala Asn
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                                             125
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Cys Val Val Asn Trp Thr Ser Arg Thr Met Leu Ser Thr Asn Lys Asn
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                                         140
Ile Pro Gly Arg Asn Gln Pro Met Tyr Gly Leu Gly Val Met Thr Gly
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Tyr Lys His Phe Ile Gly Lys Lys Arg Trp Phe Gly Leu Arg Tyr Tyr
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              165
                                          175
Gly Phe Phe Asp Tyr Gly His Thr Asn Phe Ser Asn Ser Arg Ala Ala
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Asn Ala Ile Ser Pro Phe Tyr Leu Ser Asp Gln Lys Ala Asp Met Tyr
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Thr Tyr Gly Phe Gly Thr Asp Met Leu Phe Asn Ile Ile Asp Lys Pro
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Lys Ala Thr Ala Gly Phe Phe Leu Gly Val Asn Phe Ala Gly Asn Thr
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His His Gly Ile Glu Phe Gly Ile Lys Ile Pro Thr Leu Pro Asn Tyr
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Glu Asn Gly Gln Pro Thr Thr Ile Thr Gly Ala Glu Thr Asn Phe Ser
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agc att ttt ctt ttg gtg ctt ttt tct tta tcg tgt aag ttt ttg ggc Ser Ile Phe Leu Leu Val Leu Phe Ser Leu Ser Cys Lys Phe Leu Gly 100 105 110	391
aag aaa aac cct att ggt aaa tat atc cac cct atc gct cta act ttt Lys Lys Asn Pro Ile Gly Lys Tyr Ile His Pro Ile Ala Leu Thr Phe 120 125 130	439
ggc ttt tta atc gcc att tta gcc aaa acg atg tgg ttt gtt Gly Phe Leu Ile Ala Ile Leu Ala Lys Thr Met Trp Phe Val 135 140 145	481
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65					Met 70					75					80	
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Phe	Leu	Gly 115		Lys	Asn	Pro	Ile 120	Gly	Lys	Tyr	Ile	His 125	Pro	Ile	Ala	
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					(584)											
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													1	Glu	пуъ	
tta	ttt	gaa	aag	ata	ttg	cat	gaa	atg	aga	tca	aga	act	1 tct	ttt	ctg	104
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ctt Leu 20 gtt Val atc Ile	Phe 5 gct Ala ttt Phe ctt Leu att	Glu ttt Phe caa Gln tct Ser	gtc Val ttg Leu ttt Phe 55	gtt Val att Ile 40 tct Ser	tcg Ser 25 ttt Phe ctt Leu	His 10 ctt Leu gag Glu tct Ser	Glu att Ile tct Ser ttt Phe caa	Met gtt Val att Ile ttc Phe 60 ata	ttt Phe ttc Phe 45 ttt Phe	att Ile 30 caa Gln att Ile ctt	Arg 15 ttt Phe tac Tyr ttc Phe	Thr aat Asn acc Thr ttt Phe	tct Ser cta Leu caa Gln ttc Phe 65	ttt Phe aaa Lys aac Asn 50 ttt Phe	ctg Leu ggg Gly 35 aaa Lys tac Tyr	152 200
ctt Leu 20 gtt Val atc Ile	Phe 5 gct Ala ttt Phe ctt Leu att	Glu ttt Phe caa Gln tct Ser	gtc Val ttg Leu ttt Phe 55	gtt Val att Ile 40 tct Ser	tcg Ser 25 ttt Phe ctt Leu	His 10 ctt Leu gag Glu tct Ser	Glu att Ile tct Ser ttt Phe caa	Met gtt Val att Ile ttc Phe 60 ata	ttt Phe ttc Phe 45 ttt Phe	att Ile 30 caa Gln att Ile ctt	Arg 15 ttt Phe tac Tyr ttc Phe	Thr aat Asn acc Thr ttt Phe	tct Ser cta Leu caa Gln ttc Phe 65	ttt Phe aaa Lys aac Asn 50 ttt Phe	ctg Leu ggg Gly 35 aaa Lys tac Tyr	152 200 248
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ctt Leu 20 gtt Val atc Ile gct Ala aaa Lys	Phe 5 gct Ala ttt Phe ctt Leu att Ile tat Tyr 85 ttc	Glu ttt Phe caa Gln tct Ser ttt Phe 70 aaa Lys cca	ttg Leu ttt Phe 55 ctt Leu caa Gln	gtt Val att Ile 40 tct Ser att Ile aat Asn	tcg Ser 25 ttt Phe ctt Leu ttt Phe	His 10 ctt Leu gag Glu tct Ser tat Tyr aga Arg 90 aaa	Glu att Ile tct Ser ttt Phe caa Gln 75 gat Asp	Met gtt Val att Ile ttc Phe 60 ata Ile agt Ser gaa	ttt Phe ttc Phe 45 ttt Phe ttt Phe ctt Phe ctt Phe ctt Phe ctt Phe ctt Phe ctt	att Ile att Ile tat	Arg 15 ttt Phe tac Tyr ttc Phe tgg Trp gtc Val 95 cgt	Thr  aat Asn  acc Thr  ttt Phe  tat Tyr 80  tat Tyr	tct Ser cta Leu caa Gln ttc Phe 65 ggg Gly aac Asn tat	ttt Phe aaa Lys aac Asn 50 ttt Phe gct Ala att Ile	ctg Leu ggg Gly 35 aaa Lys tac Tyr aaa Lys	152 200 248 296

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Tyr Leu Asp Leu Ile Gly Phe Phe Lys Ser Arg Asp Phe Phe Glu Pro
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aca aaa gac gat tat att gtc aaa ccg gat gtc tta agg gct ata aaa
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Thr Lys Asp Asp Tyr Ile Val Lys Pro Asp Val Leu Arg Ala Ile Lys
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                                                                      584
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Lys Tyr His Lys Ile Ala Phe Lys Ser Val Tyr Trp Gln Gln Asn Lys
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Gln Asn Lys Ile Leu Ser Phe Ser Leu Ser Phe Phe Phe Ile Phe Phe
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Phe Phe Tyr Ala Ile Phe Leu Ile Phe Tyr Gln Ile Phe Leu Trp Tyr
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Asn Ile Gln Lys Phe Pro Asn Glu Ile Lys Glu Glu Leu Tyr Arg Cys
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            100
Tyr Ser Lys Lys Gln Asn Lys Ile Leu Arg Thr Lys Lys Leu Asp Asp
                            120
                                                 125
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Leu Ile Asp Tyr Leu Asp Leu Ile Gly Phe Phe Lys Ser Arg Asp Phe
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                                             140
Phe Glu Pro Thr Lys Asp Asp Tyr Ile Val Lys Pro Asp Val Leu Arg
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gtt ttc aat aat gga ttt ttt aag att aaa aag ttc ttt val Phe Asn Asn Gly Phe Phe Lys Ile Lys Lys Phe Phe 20 25 30	
gtg gtg ggg gtc gtt ttc gct atc tgg ttt tat gta gtt a Val Val Gly Val Val Phe Ala Ile Trp Phe Tyr Val Val 35 40 45	
acc cgt tgg cgt gtg gtg aat gat gat ttc atc gtt ttc.  Thr Arg Trp Arg Val Val Asn Asp Asp Phe Ile Val Phe  55 60	taatttaaga 249
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Lys Ala Val Phe Asn Asn Gly Phe Phe Lys Ile Lys Lys :	Phe Phe Leu 30
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aac gct ttg aat aaa atc aaa aaa ggg tta ttg gtg ttt taaatgtgtg Asn Ala Leu Asn Lys Ile Lys Lys Gly Leu Leu Val Phe 70 75	297
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agg gct aaa aaa aac gac gat ttg cgt tcg ttt ttt gaa gaa ttt tta	248

Arg Ala 50	Lys	Lys	Asn	Asp 55	Asp	Leu	Arg	Ser	Phe 60	Phe	Glu	Glu	Phe	Leu 65	
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caa gaa Gln Glu															344
cct aaa Pro Lys															392
tat aac Tyr Asn 115	Leu														440
att tta Ile Leu 130															488
att gtg Ile Val															536
ttt gac Phe Asp															584
atg agc Met Ser															632
ttt agt Phe Ser 195	Leu														680
caa agc Gln Ser 210				Ser	Phe		Lys	Āsp	Leu	Thr					728
tgg ttt Trp Phe			_		-										776
att ata Ile Ile															824
aac gaa Asn Glu															872
gcg caa Ala Gln 275	Gly														920

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					aat Asn											1112
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					gta Val											1304
					gtg Val											1352
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Gly ggg	ttt Phe	gaa Glu	tac Tyr 485	acc Thr	agc Ser	gat Asp	caa Gln	gaa Glu 490	aag Lys	gct Ala	atc Ile	gct Ala	gaa Glu 495	att Ile	tca Ser	1544
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gtg Val	ggt Gly 515	ttt Phe	ggg	aaa Lys	aca Thr	gaa Glu 520	gtg Val	gcg Ala	atg Met	cat His	gcg Ala 525	att Ile	ttt Phe	tgc Cys	gcg Ala	1640

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ggg Gly	att Ile	cat His	ttg Leu	cct Pro	aac Asn	gct Ala	aac Asn	acg Thr	atc Ile	att Ile	ata Ile	gat Asp	aat Asn	gcg Ala	caa Gln	:	2360

755 760 765

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3101

375

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Asp Asp Le		Ala	Gln	Phe 935		Gln	Ile	Ile	Thr 940	Leu	Lys	Ile	Leu	
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Thr Ile Th	ır Tyr	Ser 965		Glu	Lys	Lys	Glu 970	Ser	Leu	Lys	Ala	Pro 975	Ser	
Lys Asp As	p Asn 980		Ile	Leu	Glu	Thr 985		Leu	Lys	His	Leu 990		Ala	
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Glu		115					120					125				
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ttc Phe 20	gct Ala	gaa Glu	ggt Gly	tta Leu	gag Glu 25	Gly ggg	ttt Phe	ttt Phe	aac Asn	gcc Ala 30	. Leu	gaa Glu	gcc Ala	cag Gln	ctc Leu 35	211
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### Comparison of Comparison o	1349
### Comparison of Comparison o	1349
Columbia	1349

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ctt a Leu 1 50	atg Met	gat Asp	cgg Arg	agt Ser	ttc Phe 55	agg Arg	tgc Cys	ttg Leu	gac Asp	aat Asn 60	aaa Lys	gcc Ala	cgc Arg	ttt Phe	gaa Glu 65	248
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ccg Pro	ttt Phe	gaa Glu	aaa Lys 85	gtg Val	ctt Leu	tta Leu	atg Met	ggg Gly 90	ttt Phe	tta Leu	agc Ser	ttt Phe	ggg Gly 95	aaa Lys	atg Met	344
ctc Leu	cct Pro	gat Asp 100	atg Met	agc Ser	gtg Val	cct Pro	ttc Phe 105	ttt Phe	gtc Val	aat Asn	aaa Lys	atc Ile 110	aga Arg	agc Ser	gac Asp	392
acg Thr	aaa Lys 115	gcg Ala	atg Met	gtc Val	ttg Leu	gat Asp 120	caa Gln	gaa Glu	gag Glu	agc Ser	cag Gln 125	tta Leu	aaa Lys	gag Glu	cgg Arg	440
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atc Ile	acg Thr	acg Thr 180	Ile	ttt Phe	tct Ser	caa Gln	ato Ile 185	. Asn	ato Ile	ctt Leu	gat Asp	ttt Phe 190	Glu	tac Tyr	tct Ser	632
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355

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360

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acc Thr	gat Asp	ttt Phe	att Ile 485	tta Leu	aaa Lys	gcc Ala	aac Asn	cga Arg 490	gaa Glu	tgg Trp	gct Ala	aaa Lys	aaa Lys 495	gtg Val	cgc Arg	1544
gag Glu	aaa Lys	atg Met 500	cgt Arg	aac Asn	gct Ala	cct Pro	att Ile 505	tta Leu	gag Glu	ctt Leu	tac Tyr	cca Pro 510	gag Glu	atg Met	gat Asp	1592
Gly aaa	agg Arg 515	ttt Phe	gaa Glu	gat Asp	cct Pro	aat Asn 520	cta Leu	acc Thr	cct Pro	tta Leu	gaa Glu 525	gtc Val	ttt Phe	gat Asp	aga Arg	1640
atc Ile 530	cat His	cat His	aaa Lys	aaa Lys	atc Ile 535	gct Ala	agc Ser	gtg Val	cat His	tta Leu 540	gcg Ala	gat Asp	aag Lys	gaa Glu	gcg Ala 545	1688
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cca Pro	tgg Trp	aat Asr	ttc Phe 645	Pro	gtg Val	ggc Gly	att Ile	tct Ser 650	· Val	ggc Gly	act Thr	ato Ile	gct Ala 655	. Ala	ccc Pro	2024
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cat His	ctt Leu	tta Leu	aga Arg	gat Asp 710	gaa Glu	agc Ser	atc Ile	cag Gln	ttt Phe 715	gcc Ala	att Ile	tta Leu	acc Thr	ggg Gly 720	ggc Gly	2216
gaa Glu	gac Asp	acc Thr	gct Ala 725	tat Tyr	aaa Lys	atg Met	tta Leu	aaa Lys 730	gct Ala	aac Asn	ccc Pro	act Thr	tta Leu 735	gcc Ala	ttg Leu	2264
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gac Asp	aga Arg 755	gac Asp	cag Gln	gcg Ala	att Ile	aag Lys 760	aat Asn	gtt Val	atc Ile	cat His	tca Ser 765	gct Ala	ttt Phe	agc Ser	aat Asn	2360
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gca Ala	ı aaa ı Lys	gat Asp	tta Leu 885	ı Asp	gaa Glu	gcg Ala	ata Ile	gaa Glu 890	ı Ile	gco Ala	aat Asn	tct Ser	acc Thr 895	GTZ	tac Tyr	2744
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gct gtg ggg Ala Val Gly	ttt ggg ag Phe Gly Ar 950	g aaa gta g Lys Val	ggc att Gly Ile 955	ttc aac Phe Asn	tat atc Tyr Ile	acg caa Thr Gln 960	2936
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ccc tta agc Pro Leu Ser 980	gaa gcc tt Glu Ala Le	a gaa aac ı Glu Asn 985	Leu Thr	caa aaa Gln Lys	ggc tat Gly Tyr 990	gat gag Asp Glu	3032
cat acg cat His Thr His 995	gag ttg aa Glu Leu Ly	g cgc gcg s Arg Ala 1000	att ttt . Ile Phe	atg gca Met Ala 1005	aaa agc Lys Ser	tac gct Tyr Ala	3080
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gct aaa cca Ala Lys Pro	a tgc cta aa o Cys Leu A:	it ggg cg sn Gly Arg	t ttt gaa g Phe Gli	a ttg ctg ı Leu Lev	g tat tac ı Tyr Tyr	cac tta His Leu	3512

1150 1145 1140

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Glu 785		. Туг	GLU	ı Asp	790		rne	ьys	пĀS	795			. ASL	, Alc	800

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                    855
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Glu Ala Lys Asp Leu Asp Glu Ala Ile Glu Ile Ala Asn Ser Thr Gly
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Tyr Gly Leu Thr Ser Ala Leu Glu Ser Leu Asp Glu Arg Glu Trp Glu
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Ser Ala Val Gly Phe Gly Arg Lys Val Gly Ile Phe Asn Tyr Ile Thr
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Asn Pro Leu Ser Glu Ala Leu Glu Asn Leu Thr Gln Lys Gly Tyr Asp
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Gly Tyr Arg Ile Thr Glu Lys Asp Thr Leu Ser Asp Met Leu Gly Val
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cct tta aaa gag ggc ttt ttg aaa agt ttt aaa gag cgt tgc aat ttg Pro Leu Lys Glu Gly Phe Leu Lys Ser Phe Lys Glu Arg Cys Asn Leu $40$ $45$ . $50$	259								
gaa ttt tta gaa aat tta gac ctt ttg ttt ttg tat gac aaa cca tcc Glu Phe Leu Glu Asn Leu Asp Leu Leu Phe Leu Tyr Asp Lys Pro Ser 55 60 65	307								
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Cys Asn Leu Glu Phe Leu Glu Asn Leu Asp Leu Leu Phe Leu Tyr Asp
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Lys Pro Ser Ala His Glu Ile Phe Ser Leu Cys Lys Glu Leu Lys Asn
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Asn Thr Tyr Ala Gln Glu Ser Lys Leu Arg Leu Lys Thr Lys Ile Gly
gct gat ggg cgg tgc gtg att gaa gac aat ttt ttc acg ccc ccc ttt
                                                                       156
Ala Asp Gly Arg Cys Val Ile Glu Asp Asn Phe Phe Thr Pro Pro Phe
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aag ctc atg gcg ccc ttt tac cct aaa gac gat tta gcg gaa atc atg
                                                                       204
Lys Leu Met Ala Pro Phe Tyr Pro Lys Asp Asp Leu Ala Glu Ile Met
     35
ctt tta gcg gta agc cct ggc atg atg agg ggc gat gcg caa gat gtg
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Leu Leu Ala Val Ser Pro Gly Met Met Arg Gly Asp Ala Gln Asp Val
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caa Gln	tta Leu	aac Asn	atc Ile	ggt Gly 70	cca Pro	aat Asn	tgc Cys	aag Lys	tta Leu 75	agg Arg	atc Ile	act Thr	tcg Ser	caa Gln 80	tcc Ser	300
ttt Phe	gaa Glu	aaa Lys	atc Ile 85	cat His	aac Asn	act Thr	gaa Glu	gat Asp 90	ggg Gly	ttt Phe	gcc Ala	agc Ser	aga Arg 95	gac Asp	atg Met	348
cat His	att Ile	gtt Val 100	gtg Val	ggg Gly	gaa Glu	aac Asn	gct Ala 105	ttt Phe	tta Leu	gat Asp	ttt Phe	gcg Ala 110	cct Pro	ttc Phe	ccg Pro	396
tta Leu	atc Ile 115	ccc Pro	ttt Phe	gaa Glu	aac Asn	gcg Ala 120	cat His	ttt Phe	aag Lys	ggc Gly	aac Asn 125	acc Thr	acg Thr	att Ile	tct Ser	444
ttg Leu 130	cgc Arg	tct Ser	agc Ser	tct Ser	caa Gln 135	ttg Leu	ctc Leu	tat Tyr	agt Ser	gaa Glu 140	atc Ile	att Ile	gtc Val	gca Ala	ggg Gly 145	492
cga Arg	gtg Val	gcg Ala	cgc Arg	aat Asn 150	gag Glu	ttg Leu	ttt Phe	aaa Lys	ttc Phe 155	aac Asn	cgc Arg	ttg Leu	cac His	acc Thr 160	aaa Lys	540
atc Ile	tct Ser	att Ile	tta Leu 165	caa Gln	gat Asp	gag Glu	aaa Lys	ccc Pro 170	atc Ile	tat Tyr	tat Tyr	gac Asp	aac Asn 175	acg Thr	att Ile	588
tta Leu	gat Asp	ccc Pro 180	aaa Lys	acc Thr	acc Thr	gac Asp	tta Leu 185	aat Asn	aac Asn	atg Met	tgc Cys	atg Met 190	ttt Phe	gat Asp	ggc Gly	636
tat Tyr	acg Thr 195	cat His	tat Tyr	ttg Leu	aat Asn	ttg Leu 200	gtg Val	ctt Leu	gtc Val	aat Asn	tgc Cys 205	Pro	ata Ile	gag Glu	ctc Leu	684
tct Ser 210	ggt Gly	gtg Val	cga Arg	gaa Glu	tgc Cys 215	att Ile	gaa Glu	gaa Glu	agc Ser	gaa Glu 220	ggg	gtg Val	gat Asp	Gly aaa	gca Ala 225	732
gtg Val	g agt Ser	gaa Glu	acc Thr	gct Ala 230	Ser	tct Ser	cat His	tta Leu	tgc Cys 235	Val	aaa Lys	gct Ala	tta Leu	gcg Ala 240	aaa Lys	780
Gl7	tca Ser	gaa Glu	ccc Pro 245	Leu	. ttg . Leu	cat His	tta Leu	aga Arg 250	Glu	aaa Lys	atc Ile	gct Ala	cgc Arg 255	Leu	gtt Val	828
acç Thi	g caa Gln	acc Thr 260	Thr	acg Thr	caa Gln	aag Lys	gtt Val 265		ıaagc	act	tcaa	ıaaag	at t	aaag	tcctt	882
tag	gtctt	ttt	acto	cccc	ct t	tttt	tgac	c ct	ataa	gctg	, aaa	ggcc	tga	atto	agta	940
			· 250 · 265													

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Met Leu Leu Ala Val Ser Pro Gly Met Met Arg Gly Asp Ala Gln Asp
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                                           60
Val Gln Leu Asn Ile Gly Pro Asn Cys Lys Leu Arg Ile Thr Ser Gln
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Ser Phe Glu Lys Ile His Asn Thr Glu Asp Gly Phe Ala Ser Arg Asp
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Met His Ile Val Val Gly Glu Asn Ala Phe Leu Asp Phe Ala Pro Phe
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                              105
Pro Leu Ile Pro Phe Glu Asn Ala His Phe Lys Gly Asn Thr Thr Ile
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Ser Leu Arg Ser Ser Ser Gln Leu Leu Tyr Ser Glu Ile Ile Val Ala
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                                          140
Gly Arg Val Ala Arg Asn Glu Leu Phe Lys Phe Asn Arg Leu His Thr
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                                      155
Lys Ile Ser Ile Leu Gln Asp Glu Lys Pro Ile Tyr Tyr Asp Asn Thr
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Ile Leu Asp Pro Lys Thr Thr Asp Leu Asn Asn Met Cys Met Phe Asp
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Gly Tyr Thr His Tyr Leu Asn Leu Val Leu Val Asn Cys Pro Ile Glu
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Leu Ser Gly Val Arg Glu Cys Ile Glu Glu Ser Glu Gly Val Asp Gly
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Ala Val Ser Glu Thr Ala Ser Ser His Leu Cys Val Lys Ala Leu Ala
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                                                                    104
Lys Ile Ser Arg Lys Glu Tyr Val Ser Met Tyr Gly Pro Thr Thr Gly
gat aaa gtg aga ttg ggc gat aca gac ttg atc gct gaa gta gaa cat
                                                                    152
Asp Lys Val Arg Leu Gly Asp Thr Asp Leu Ile Ala Glu Val Glu His
                                                                    200
gac tac acc att tat ggc gaa gag ctt aaa ttc ggt ggc ggt aaa acc
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Asp 35	Tyr	Thr	Ile	Tyr	Gly 40	Glu	Glu	Leu	Lys	Phe 45	Gly	Gly	Gly	Lys	Thr 50		
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gat Asp	cta Leu	atc Ile	atc Ile 70	act Thr	aac Asn	gct Ala	tta Leu	atc Ile 75	gtg Val	gat Asp	tac Tyr	acc Thr	ggt Gly 80	att Ile	tat Tyr	:	296
aaa Lys	gcg Ala	gat Asp 85	att Ile	ggt Gly	att Ile	aaa Lys	gat Asp 90	ggc Gly	aaa Lys	atc Ile	gct Ala	ggc Gly 95	att Ile	ggt Gly	aaa Lys		344
ggc	ggt Gly 100	aac Asn	aaa Lys	gac Asp	atg Met	caa Gln 105	gat Asp	ggc Gly	gtt Val	aaa Lys	aac Asn 110	aat Asn	ctt Leu	agc Ser	gta Val		392
ggt Gly 115	cct Pro	gct Ala	act Thr	gaa Glu	gcc Ala 120	tta Leu	gcc Ala	ggt Gly	gaa Glu	ggt Gly 125	ttg Leu	atc Ile	gta Val	act Thr	gct Ala 130		440
ggt Gly	ggt Gly	att Ile	gac Asp	aca Thr 135	cac His	atc Ile	cac His	ttc Phe	att Ile 140	tca Ser	ccc Pro	caa Gln	caa Gln	atc Ile 145	cct Pro		488
aca Thr	gct Ala	ttt Phe	gca Ala 150	agc Ser	ggt Gly	gta Val	aca Thr	acc Thr 155	atg Met	att Ile	ggt Gly	ggc Gly	gga Gly 160	act Thr	ggt Gly		536
cct Pro	gct Ala	gat Asp 165	ggc Gly	act Thr	aat Asn	gcg Ala	act Thr 170	act Thr	atc Ile	act Thr	cca Pro	ggc Gly 175	aga Arg	aga Arg	aat Asn		584
tta Leu	aaa Lys 180	tgg Trp	atg Met	ctc Leu	aga Arg	gcg Ala 185	gct Ala	gaa Glu	gaa Glu	tat Tyr	tct Ser 190	atg Met	aac Asn	tta Leu	ggt Gly		632
ttc Phe 195	Leu	gct Ala	aaa Lys	ggt Gly	aac Asn 200	gct Ala	tct Ser	aac Asn	gac Asp	gcg Ala 205	agc Ser	tta Leu	gcc Ala	gat Asp	caa Gln 210		680
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gaa Glu	gac Asp 260	Thr	atg Met	gca Ala	gct Ala	att Ile 265	Ala	gga Gly	cgc Arg	act Thr	atg Met 270	His	act Thr	ttc Phe	cac His		872

act Thr 275	gaa Glu	ggt Gly	gct Ala	ggc Gly	ggc Gly 280	gga Gly	cac His	gct Ala	cct Pro	gat Asp 285	att Ile	att Ile	aaa Lys	gta Val	gct Ala 290	920	
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atc Ile	cct Pro	acc Thr	cca Pro 470	Gln	cca Pro	gtt Val	tat Tyr	tac Tyr 475	Arg	gaa Glu	atg Met	ttc Phe	gct Ala 480	His	cat His	1496	
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tat Tyr	gac Asp 500	Lys	ggc Gly	att Ile	aaa Lys	gaa Glu 505	ı Glü	ı tta ı Leu	ggg Gly	ctt Leu	gaa Glu 510	ı Arg	caa Glr	gtg Val	f ttg . Leu	1592	

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gac a Asp	act Thr	acc Thr	gct Ala	cac His 535	att Ile	gaa Glu	gtc Val	aat Asn	cct Pro 540	gaa Glu	act Thr	tac Tyr	cat His	gtg Val 545	ttc Phe	1688
gtg ( Val :	gat Asp	ggc Gly	aaa Lys 550	gaa Glu	gta Val	act Thr	tct Ser	aaa Lys 555	cca Pro	gcc Ala	aat Asn	aaa Lys	gtg Val 560	agc Ser	ttg Leu	1736
gcg Ala	Gln						tagg	gattt	ett t	agga	agcaa	ac go	ctcct	taaa	a	1787
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145 Thr	Gly	Pro	Ala	Asp 165	Gly	Thr	Asn	Ala	Thr	Thr		Thr	Pro	Gly 175	Arg	
Arg	Asn	Leu		Trp	Met	Leu	. Arg	Ala 185	Ala		Glu	Tyr	Ser	Met	Asn	
Leu	Gly			Ala	Lys	Gly		Ala		Asn	. Asp	Ala 205	Ser		ı Ala	
Asp			Glu	. Ala	Gly	Ala 215			Phe	Lys	11e	His		ı Asp	Trp	
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225 Tyr	Asp	Val	Gln			, i Ile	His	Thr	Asp 250	Thr		ı Asr	ı Glu	1 Ala 255	a Gly	
Cys	Val	Glu	Asp 260		Met	: Ala	a Ala	11e 265	e Ala		y Arg	Thr	Met 270	His	Thr	

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Phe His Thr Glu Gly Ala Gly Gly Gly His Ala Pro Asp Ile Ile Lys
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Val Ala Gly Glu His Asn Ile Leu Pro Ala Ser Thr Asn Pro Thr Ile
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Pro Phe Thr Val Asn Thr Glu Ala Glu His Met Asp Met Leu Met Val
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                                        315
Cys His His Leu Asp Lys Ser Ile Lys Glu Asp Val Gln Phe Ala Asp
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Ser Arg Ile Arg Pro Gln Thr Ile Ala Ala Glu Asp Thr Leu His Asp
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Met Gly Ile Phe Ser Ile Thr Ser Ser Asp Ser Gln Ala Met Gly Arg
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Lys Glu Phe Gly Arg Leu Lys Glu Glu Lys Gly Asp Asn Asp Asn Phe
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Asp Leu Val Leu Trp Ser Pro Ala Phe Phe Gly Val Lys Pro Asn Met
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Ile Ile Lys Gly Gly Phe Ile Ala Leu Ser Gln Met Gly Asp Ala Asn
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Ala Ser Ile Pro Thr Pro Gln Pro Val Tyr Tyr Arg Glu Met Phe Ala
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His His Gly Lys Ala Lys Tyr Asp Ala Asn Ile Thr Phe Val Ser Gln
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Ala Ala Tyr Asp Lys Gly Ile Lys Glu Glu Leu Gly Leu Glu Arg Gln
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Val Leu Pro Val Lys Asn Cys Arg Asn Ile Thr Lys Lys Asp Met Gln
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Phe Asn Asp Thr Thr Ala His Ile Glu Val Asn Pro Glu Thr Tyr His
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 Ile Ala His Ser Asn Glu Ile Ala Arg Pro Ile Phe Lys Ser Gln Asp
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                                                                       152
 cag ctt ttc act ctt tat caa ggg gat tgt aat gag gtt ttg ccc caa
 Gln Leu Phe Thr Leu Tyr Gln Gly Asp Cys Asn Glu Val Leu Pro Gln
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20 25 30

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aaa Lys	ggc Gly	gat Asp	tgg Trp 70	gat Asp	aaa Lys	gaa Glu	gat Asp	ggg Gly 75	att Ile	aat Asn	ggt Gly	att Ile	gat Asp 80	gag Glu	ttt Phe	296
aat Asn	tac Tyr	cag Gln 85	tgg Trp	ata Ile	aac Asn	aac Asn	gct Ala 90	aaa Lys	aag Lys	gct Ala	tta Leu	aaa Lys 95	gac Asp	aca Thr	gga Gly	344
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aaa Lys	acc Thr	aac Asn	cct Pro	cct Pro 135	ccc Pro	aat Asn	ttc Phe	agc Ser	tgc Cys 140	cgt Arg	tat Tyr	ttg Leu	acg Thr	cat His 145	tca Ser	488
gct Ala	gag Glu	caa Gln	atc Ile 150	att Ile	tgg Trp	gcg Ala	aga Arg	aaa Lys 155	agc Ser	cgc Arg	aaa Lys	cac His	aag Lys 160	cat His	gtt Val	536
ttt Phe	aac Asn	tat Tyr 165	gag Glu	gtt Val	tta Leu	aaa Lys	aag Lys 170	atc Ile	aat Asn	aac Asn	gac Asp	aag Lys 175	caa Gln	atg Met	cgc Arg	584
gat Asp	gtg Val 180	tgg Trp	agc Ser	ttc Phe	cca Pro	gcg Ala 185	atc Ile	gct Ala	cct Pro	tgg Trp	gaa Glu 190	aaa Lys	gtt Val	aat Asn	ggc Gly	632
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atg Met	gcg Ala	agc Ser	gat Asp	gaa Glu 215	aat Asn	tct Ser	ctc Leu	att Ile	ggc Gly 220	gat Asp	cct Pro	ttt Phe	agc Ser	ggg Gly 225	agc Ser	728
tct Ser	acc Thr	aca Thr	ggc Gly 230	att Ile	gcg Ala	gct Ala	aat Asn	ctt Leu 235	ttg Leu	aag Lys	agg Arg	gaa Glu	ttt Phe 240	att Ile	ggc Gly	776
ata Ile	gaa Glu	aaa Lys 245	Glu	agc Ser	gag Glu	ttt Phe	atc Ile 250	Lys	ata Ile	tcc Ser	atg Met	gat Asp 255	Arg	aaa Lys	ata Ile	824
gaa	tta	gac	gct	cgc	tat	aaa	gaa	atc	cga	tct	aaa	atc	aaa	gat	tta	872

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Phe Leu Ser Asn Asp Gly Leu Ser Ile Gln Ser Gly Lys Ile Val Ser
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Val Asn Lys Gly Asp Trp Asp Lys Glu Asp Gly Ile Asn Gly Ile Asp
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                    70
Glu Phe Asn Tyr Gln Trp Ile Asn Asn Ala Lys Lys Ala Leu Lys Asp
                                   90
                85
Thr Gly Ser Leu Leu Ile Ser Gly Thr Tyr His Asn Ile Phe Ser Leu
                               105
Gly Cys Val Leu Gln Lys Leu Asp Phe Lys Ile Leu Asn Leu Ile Thr
                                                125
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Trp Gln Lys Thr Asn Pro Pro Pro Asn Phe Ser Cys Arg Tyr Leu Thr
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His Ser Ala Glu Gln Ile Ile Trp Ala Arg Lys Ser Arg Lys His Lys
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                    150
His Val Phe Asn Tyr Glu Val Leu Lys Lys Ile Asn Asn Asp Lys Gln
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                165
Met Arg Asp Val Trp Ser Phe Pro Ala Ile Ala Pro Trp Glu Lys Val
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                               185
Asn Gly Lys His Pro Thr Gln Lys Pro Leu Ala Leu Leu Val Arg Leu
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Gly Ser Ser Thr Thr Gly Ile Ala Ala Asn Leu Leu Lys Arg Glu Phe
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His Trp Leu Phe Gly His Glu Asn Ile Leu Cys Lys Glu Trp Val Lys

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Lys Glu Asn Pro Pro Ile	Val Phe Gly Pro Val	L Leu Ser Arg Arg Phe	
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ggg aag tct ttg ggc gtg	gat cta tcg ccc tct	t aaa aaa caa tgc aat	152
Gly Lys Ser Leu Gly Val	Asp Leu Ser Pro Ser	c Lys Lys Gln Cys Asn	
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tac aat tgc att tat tgc Tyr Asn Cys Ile Tyr Cys 35 40	Glu Leu Gly Lys Ala	a Lys Pro Ile Glu Arg	200
atg gaa gaa gtg atc aaa	gtg gaa acc ttg att	t aac gcc att caa aac	248
Met Glu Glu Val Ile Lys	Val Glu Thr Leu Ile	e Asn Ala Ile Gln Asn	
55	60	65	
gcc cta aac aac ctc acc	e acc ccc att gat gtt	t tta acc att acc gct	296
Ala Leu Asn Asn Leu Thr	Thr Pro Ile Asp Val	1 Leu Thr Ile Thr Ala	
70	75	80	
aat ggc gaa ccc acg cta	tac cct cat tta tta	a gag ctt atc caa agc	344
Asn Gly Glu Pro Thr Leu	Tyr Pro His Leu Leu	u Glu Leu Ile Gln Ser	
85	90	95	
atc aag cct ttt tta aag	g ggc gtt aaa act ttg	g att tta agc aat ggc	392
Ile Lys Pro Phe Leu Lys	Gly Val Lys Thr Let	u Ile Leu Ser Asn Gly	
100	105	110	
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Ile Val Lys Phe Ser Let	1 Asp Ala Ile Asp Le	u Lys Ala Phe Glu Arg	
135	140	145	
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Val Asp Lys Pro Tyr Se	Lys Asp Ile Asn Ly	s Ile Leu Glu Gly Ile	
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Leu Arg Phe Ser Gln Ile	Tyr Gln Gly Gln Le	u Val Ala Glu Val Leu	

165 170 175

tta Leu	att Ile 180	aag Lys	ggc Gly	gtg Val	aat Asn	gat Asp 185	agc Ser	gcg Ala	aac Asn	aac Asn	tta Leu 190	aaa Lys	ctc Leu	atc Ile	gct Ala	632
gcc Ala 195	ttt Phe	tta Leu	aaa Lys	caa Gln	atc Ile 200	aat Asn	ata Ile	gcc Ala	aga Arg	gtg Val 205	gat Asp	tta Leu	agc Ser	acc Thr	ata Ile 210	680
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tta Leu	aaa Lys	tgc Cys	tct Ser 230	tta Leu	ttt Phe	ttt Phe	gaa Glu	ggg Gly 235	ctt Leu	tgc Cys	gtg Val	agt Ser	ttg Leu 240	cct Pro	aaa Lys	776
cga Arg	tcc Ser	att Ile 245	act Thr	caa Gln	gct Ala	aaa Lys	aaa Lys 250	ttg Leu	att Ile	tct Ser	tgc Cys	ggt Gly 255	ata Ile	gac Asp	gaa Glu	824
Leu	ctc Leu 260	gct Ala	tta Leu	att Ile	tcc Ser	agg Arg 265	cgc Arg	cct Pro	tta Leu	agc Ser	gca Ala 270	gaa Glu	gaa Glu	gcc Ala	ccc Pro	872
cta Leu 275	att Ile	cta Leu	gat Asp	tct Ser	aac Asn 280	gct Ala	ttt Phe	aag Lys	cat His	tta Leu 285	gaa Glu	act Thr	ttg Leu	tta Leu	aac Asn 290	920
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Суя	. Asn		20 Asn	Cys	Ile	Tyr	Cys	25 Glu	Leu	Gly	Lys	Ala 45	30 Lys	Pro	Ile	
Glı	ı Arg 50	35 Met	Glu	. Glu	. Val	Ile 55		Val	Glu	Thr	Leu 60		Asn	Ala	Ile	
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Th:				85	Pro				90					95	Ile	
Gli	n Ser	: Ile	Lys	Pro	Phe	e Leu	Lys	Gly	v Val	. Lys	Thr	Leu	Ile	Lev	Ser	

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Gly Ile Leu Arg Phe Ser Gln Ile Tyr Gln Gly Gln Leu Val Ala Glu
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Val Leu Leu Ile Lys Gly Val Asn Asp Ser Ala Asn Asn Leu Lys Leu
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Ile Ala Ala Phe Leu Lys Gln Ile Asn Ile Ala Arg Val Asp Leu Ser
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Thr Ile Asp Arg Pro Ser Ser Phe Lys Ala Pro Lys Leu Ser Glu Asp
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Glu Leu Leu Lys Cys Ser Leu Phe Phe Glu Gly Leu Cys Val Ser Leu
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Pro Lys Arg Ser Ile Thr Gln Ala Lys Lys Leu Ile Ser Cys Gly Ile
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aat aag gtt ggc aag aat aca gag atg gct aat aca aag gca aat aaa
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Asn Lys Val Gly Lys Asn Thr Glu Met Ala Asn Thr Lys Ala Asn Lys
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Glu Thr His Phe Lys Gln Val Ser Ala Ile Thr Asn Ile Ile Arg Ser
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gtt ggt ggg ttt ttt aca aaa att gca aag aga gtt aga gga ctt gta
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Val Gly Gly Phe Phe Thr Lys Ile Ala Lys Arg Val Arg Gly Leu Val
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Lys Lys His Pro Lys Lys Ser Ser Ala Ala Leu Val Val Leu Thr His
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														aaa Lys		641
														att Ile 200		689
														gaa Glu		737
gaa Glu	caa Gln	aat Asn 220	tgc Cys	caa Gln	gaa Glu	aat Asn	cat His 225	aat Asn	caa Gln	ttc Phe	ttt Phe	att Ile 230	aaa Lys	aaa Lys	tta Leu	785
gga Gly	att Ile 235	aag Lys	ggt Gly	ggc Gly	att Ile	gct Ala 240	ata Ile	gaa Glu	gta Val	gaa Glu	gct Ala 245	gaa Glu	tgc Cys	aaa Lys	acc Thr	833
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cca Pro	aac Asn	tct Ser	aaa Lys	caa Gln 270	cct Pro	cat His	tct Ser	caa Gln	aga Arg 275	gga Gly	tca Ser	aaa Lys	gcg Ala	caa Gln 280	gag Glu	929
ttt Phe	atc Ile	gct Ala	tat Tyr 285	ttg Leu	caa Gln	aaa Lys	gag Glu	cta Leu 290	gaa Glu	ttt Phe	ctg Leu	ccc Pro	tat Tyr 295	tcg Ser	caa Gln	977
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aaa gaa aat cta aaa ata cgc tct aaa gct caa gct aaa atg ctt gaa Lys Glu Asn Leu Lys Ile Arg Ser Lys Ala Gln Ala Lys Met Leu Glu 330 335 340 345	1121
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Adologo Ser       Val       Lys       Thr       Gly       Lys       Thr       Asn       Lys       Thr       Asn       Lys       Thr       Asn       Lys       Thr       Asn       Lys       Yal       Gly       Lys       Asn       Thr       Thr       Asn       Thr       Asn       Lys       Glu       Thr       His       Phe       Lys       Gln       Val       2s       Yal       Asn       Thr       Lys       Asn       Lys       Lys       Asn       Lys       Lys	
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Gln Thr Pro Ile Gln Pro Lys His Leu Pro Asn Ser Lys Gln Pro His
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Ser Lys Ala Gln Ala Lys Met Leu Glu Met Arg Asp Leu Lys Pro Asp
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                                                                      104
Ala Glu Leu Ile Ala Val Tyr Lys Asp Glu Gln Ile Ile Asp Leu Glu
age geg aaa gte tta ggg etg age gat ggg att aaa geg tta aac ggg
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Ser Ala Lys Val Leu Gly Leu Ser Asp Gly Ile Lys Ala Leu Asn Gly
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aca gag ccg ata tat ttt gat gat tcg cct ttg gct tta gag gtg att
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Thr Glu Pro Ile Tyr Phe Asp Asp Ser Pro Leu Ala Leu Glu Val Ile
 35
agg cat tca tgc gcg cat ttg ctt gcg caa agc ttg aaa gcc ctt tat
                                                                      248
Arg His Ser Cys Ala His Leu Leu Ala Gln Ser Leu Lys Ala Leu Tyr
                 55
ccg gac gcg aaa ttt ttt gta ggc cct gtg gta gaa gag ggg ttt tat
                                                                      296
Pro Asp Ala Lys Phe Phe Val Gly Pro Val Val Glu Glu Gly Phe Tyr
             70
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							aaa Lys 110			392
							cgt Arg			440
							ggc Gly			488
							aag Lys			536
		_				-	act Thr		 	584
							ctc Leu 190			632
							gac Asp			680
-	-						cta Leu	 -		728
		_	-	-	-		 ggc Gly			776
							gaa Glu			824
							aaa Lys 270			872
							tat Tyr			920
							gaa Glu			968
							caa Gln			1016

	tac Tyr													1064
	cat His 340													1112
	acc Thr													1160
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	gat Asp		-		-	_	-				_	_		1256
	ggc Gly	_	_		_		_	_	_		-		-	1304
	tta Leu 420													1352
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	ttc Phe													1496
	atg Met													1544
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	caa Gln		-						_			_	_	1640
	aaa Lys													1688
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	_					_	_	_		-	_		gag Glu	~	1880
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165

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Ala Gly Ala Tyr Leu Gly Gly Asp Glu Asn Asn Glu Met Leu Ile Arg 180 185 Ile Tyr Gly Ile Ala Phe Ala Thr Lys Glu Gly Leu Lys Asp Tyr Leu 200 205 Phe Gln Ile Glu Glu Ala Lys Lys Arg Asp His Arg Lys Leu Gly Val 215 220

His Leu Pro Asn Thr Arg Phe Leu Asn His Phe Lys Leu Thr Lys Leu

Glu Leu Gly Leu Phe Ser Phe Asp Asp Glu Ile Gly Ala Gly Leu Pro 230 235 Leu Trp Leu Pro Lys Gly Ala Arg Leu Arg Lys Arg Ile Glu Asp Leu

250

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											ttg Leu				34	4
_			_	_		_				-	ttt Phe 110				39	2
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				-	_						aaa Lys				68	0
	_		_	_			-	-	-	-	gtt Val		-	-	72	8
											atg Met				77	6

230 235 240 att aaa gag cgt ttg cct aaa ctt tta caa ggg gtg ttg gaa gaa aaa 824 Ile Lys Glu Arg Leu Pro Lys Leu Leu Gln Gly Val Leu Glu Glu Lys 245 872 cgc cat att tta tgg agc att gat ccc atg cat ggc aac acg gtt aaa Arg His Ile Leu Trp Ser Ile Asp Pro Met His Gly Asn Thr Val Lys 265 acc agc ttg ggg gtt aaa aca agg gct ttt gat agc gtg tta gat gaa 920 Thr Ser Leu Gly Val Lys Thr Arg Ala Phe Asp Ser Val Leu Asp Glu 280 968 gtg aaa agc ttt ttt gaa atc cat agg gct gaa ggg agt ttg gct tca Val Lys Ser Phe Phe Glu Ile His Arg Ala Glu Gly Ser Leu Ala Ser ggg gtt cat ttg gaa atg aca ggt gag aat gtt aca gaa tgt atc ggt 1016 Gly Val His Leu Glu Met Thr Gly Glu Asn Val Thr Glu Cys Ile Gly 315 ggc tcg caa gcg atc acc gaa gag ggt ttg agc tgc cat tac tac acg 1064 Gly Ser Gln Ala Ile Thr Glu Glu Gly Leu Ser Cys His Tyr Tyr Thr 330 caa tgc gat cca aga tta aac gcc acc caa gcc cta gaa ctc gcc ttc 1112 Gln Cys Asp Pro Arg Leu Asn Ala Thr Gln Ala Leu Glu Leu Ala Phe 345 tta atc gct gac atg ctc aaa aaa cag cac gct tagttaaaaa gagattaatc 1165 Leu Ile Ala Asp Met Leu Lys Lys Gln His Ala tttttttaac tcttttactt tataattatc gtt 1198 <210> 264 <211> 365 <212> PRT <213> Helicobacter pylori <400> 264 Met Phe Lys Val Met Met Gln Met Ala Ile Val Leu Thr Phe Ala Gly 10 Ser Ile Pro Ile Val Lys Val Gly Arg Ile Ala Gly Gln Phe Ala Lys 20 25 Pro Arg Ser Asn Ala Thr Glu Met Leu Asp Asn Glu Glu Val Leu Ser 35 40 Tyr Arg Gly Asp Ile Ile Asn Gly Ile Ser Lys Lys Glu Arg Glu Pro 55 Asn Pro Glu Arg Met Leu Lys Ala Tyr His Gln Ser Val Ala Thr Leu 70 75 Asn Leu Ile Arg Ala Phe Ala Gln Gly Gly Leu Ala Asp Leu Glu Gln 90 85 Val His Arg Phe Asn Leu Asp Phe Val Lys Asn Asn Asp Phe Gly Gln 100 105 Lys Tyr Gln Gln Ile Ala Asp Arg Ile Thr Gln Ala Leu Gly Phe Met

115 120 125 Arg Ala Cys Gly Val Glu Ile Glu Arg Thr Pro Ile Leu Arg Glu Val

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His Met Leu Trp Ile Gly Glu Arg Thr Arg Asp Pro Lys Gly Ala His
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Val Glu Phe Leu Arg Gly Val Cys Asn Pro Ile Gly Val Lys Ile Gly
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Pro Asn Ala Ser Val Ser Glu Val Leu Glu Leu Cys Asp Val Leu Asn
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Pro Arg Asn Ile Lys Gly Arg Leu Asn Leu Ile Val Arg Met Gly Ser
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                                       235
Lys Met Ile Lys Glu Arg Leu Pro Lys Leu Gln Gly Val Leu Glu
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Glu Lys Arg His Ile Leu Trp Ser Ile Asp Pro Met His Gly Asn Thr
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Val Lys Thr Ser Leu Gly Val Lys Thr Arg Ala Phe Asp Ser Val Leu
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                           280
                                               285
Asp Glu Val Lys Ser Phe Phe Glu Ile His Arg Ala Glu Gly Ser Leu
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                                           300
Ala Ser Gly Val His Leu Glu Met Thr Gly Glu Asn Val Thr Glu Cys
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                                       315
Ile Gly Gly Ser Gln Ala Ile Thr Glu Glu Gly Leu Ser Cys His Tyr
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               325
Tyr Thr Gln Cys Asp Pro Arg Leu Asn Ala Thr Gln Ala Leu Glu Leu
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Ala Phe Leu Ile Ala Asp Met Leu Lys Lys Gln His Ala
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Ala Val Arg Leu Gly Pro Pro Ile Arg Ser Met Phe Val Gly Asn Ala
ccg ttt tgg ctt tgg ttt ttt aaa gct tgc atg cct tca ctc aaa ttg
                                                                    152
Pro Phe Trp Leu Trp Phe Phe Lys Ala Cys Met Pro Ser Leu Lys Leu
cgc aca atg gat tct ttt ttc aat aag atg atg caa tta agg gtg atg
                                                                    200
Arg Thr Met Asp Ser Phe Phe Asn Lys Met Met Gln Leu Arg Val Met
                                                                    248
age gaa age aat ege ggg ett gea tge gaa gag ace gee eea ate atg
Ser Glu Ser Asn Arg Gly Leu Ala Cys Glu Glu Thr Ala Pro Ile Met
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ccc aag ctt gaa atc cca caa acc cca tgc aat aaa gcc gta tc Pro Lys Leu Glu Ile Pro Gln Thr Pro Cys Asn Lys Ala Val Se 70 75 80	
tca aac aac tct tca cgc atc gct tca att tct tta tca taaggc Ser Asn Asn Ser Ser Arg Ile Ala Ser Ile Ser Leu Ser 85 90 95	tgta 345
aagtaaaatc cttaaacgct tcaaaattca aattcaaatc tgt	388
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Lys Leu Arg Thr Met Asp Ser Phe Phe Asn Lys Met Met Gln Le	u Arg
Val Met Ser Glu Ser Asn Arg Gly Leu Ala Cys Glu Glu Thr Al 50 55 60	a Pro
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ctt gtg gcc tta ttg ccg att tta ttg ttt ttc tta tct tta at Leu Val Ala Leu Leu Pro Ile Leu Leu Phe Phe Leu Ser Leu Me 20 25 30	
ttt aaa ctc aaa ggt tat aca gcg gcc ttt ttg agc gtg gcc tt Phe Lys Leu Lys Gly Tyr Thr Ala Ala Phe Leu Ser Val Ala Le 35 40	

					ggc Gly									296
					att Ile					-	-			344
		-			aaa Lys	_	-	_	_			_		392
					ttg Leu 120									440
					gga Gly									488
					agc Ser									536
					gta Val									584
_	_		_		gta Val							-	_	632
					ttt Phe 200									680
			_	_	ggc Gly					-		-	-	728
					ttt Phe									776
					gaa Glu	_					-	-		824
	-	-			ctc Leu		-			 -				872
					aaa Lys 280									920
					gtc Val									968

300 305 295 1016 gtg att gtg cta tgg ata cag cct ttt ttt aaa gcc ttg ttt gaa aaa Val Ile Val Leu Trp Ile Gln Pro Phe Phe Lys Ala Leu Phe Glu Lys 1064 gac ggc ttg tta gct ttt tct aat ttt tat ttt gaa ttc aat aac atc Asp Gly Leu Leu Ala Phe Ser Asn Phe Tyr Phe Glu Phe Asn Asn Ile 330 agt aac cac atc ttt aaa agc ccg cct ttt gta gaa gcc aat caa agc 1112 Ser Asn His Ile Phe Lys Ser Pro Pro Phe Val Glu Ala Asn Gln Ser 345 gtg agt ttt ccg gtg gtg ttt aaa ttt ctc tta atc aac acg gtt ggc 1160 Val Ser Phe Pro Val Val Phe Lys Phe Leu Leu Ile Asn Thr Val Gly 360 1208 act tcc att ttt tta gcc gct ctt gtt agc atg ctc gtt tta agg gtg Thr Ser Ile Phe Leu Ala Ala Leu Val Ser Met Leu Val Leu Arg Val 375 380 1256 cga gtg agc gat gcg ctg agc gtc ttt ggc gag act tta aaa gaa atg Arg Val Ser Asp Ala Leu Ser Val Phe Gly Glu Thr Leu Lys Glu Met 390 395 cgt tac ccc att ctc acc att ggt tta gtc tta agc ttt gcc tat gtg 1304 Arg Tyr Pro Ile Leu Thr Ile Gly Leu Val Leu Ser Phe Ala Tyr Val 410 tot aat tac ago ggg att tot too act ota goo tta gog oto acg cat 1352 Ser Asn Tyr Ser Gly Ile Ser Ser Thr Leu Ala Leu Ala Leu Thr His 425 1400 acg ggt ttg gct ttc acc ttt ttc tcg ccc ttg atc ggg tgg gta ggc Thr Gly Leu Ala Phe Thr Phe Phe Ser Pro Leu Ile Gly Trp Val Gly 445 440 gtg ttt tta acc ggg agc gat acg agt tcc aat ctt ttg ttt ggc tct 1448 Val Phe Leu Thr Gly Ser Asp Thr Ser Ser Asn Leu Leu Phe Gly Ser 460 1496 tta caq caa ctc acc qcc caa cga ttg cac ctc cct gag gtt tta acc Leu Gln Gln Leu Thr Ala Gln Arg Leu His Leu Pro Glu Val Leu Thr 475 cta acg gct aat acc gtg ggt ggc act tta ggc aag atg ata agc cct 1544 Leu Thr Ala Asn Thr Val Gly Gly Thr Leu Gly Lys Met Ile Ser Pro 490 1592 caa agc atc gct atc gct tgc gcg gcg gtg ggg tta gcc ggg aaa gag Gln Ser Ile Ala Ile Ala Cys Ala Ala Val Gly Leu Ala Gly Lys Glu 505 1640 age gat ttg tte aaa tte aeg gtt aaa tae tee ett att ttt gta geg Ser Asp Leu Phe Lys Phe Thr Val Lys Tyr Ser Leu Ile Phe Val Ala 520 525

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gtg cct gcg ata aag tagggccatt ttagatttag cagggtttaa cccccaaata
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Val Pro Ala Ile Lys
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                                                                    1756
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           20
                                25
Met Val Phe Lys Leu Lys Gly Tyr Thr Ala Ala Phe Leu Ser Val Ala
                           40
                                                45
Leu Ser Ala Val Ile Ala Val Leu Val Tyr Lys Met Pro Val Ser Met
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                                            60
Val Gly Ser Ser Phe Leu Tyr Gly Phe Leu Tyr Gly Leu Trp Pro Ile
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                   70
Ala Trp Ile Ile Ile Ala Ala Ile Phe Leu Tyr Lys Leu Ser Val Lys
               85
                                   90
Ser Gly Tyr Phe Glu Ile Leu Lys Glu Ser Val Gln Ser Ile Thr Leu
           100
                               105
                                                    1.1.0
Asp His Arg Ile Leu Val Ile Leu Ile Gly Phe Cys Phe Gly Ser Phe
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                            120
                                                125
Leu Glu Gly Ala Ile Gly Phe Gly Gly Pro Ile Ala Ile Thr Ala Ala
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                                            140
Ile Leu Val Gly Leu Gly Leu Ser Pro Leu Tyr Ser Ala Gly Leu Cys
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                                       155
Leu Ile Ala Asn Thr Ala Pro Val Ala Phe Gly Ala Val Gly Ile Pro
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                                   170
Ile Ser Ala Met Ala Ser Ala Val Gly Val Pro Ala Ile Leu Ile Ser
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                               185
Ala Met Thr Gly Lys Ile Leu Phe Phe Val Ser Leu Leu Val Pro Phe
                           200
                                                205
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Phe Ile Val Phe Leu Met Asp Gly Phe Lys Gly Ile Lys Glu Thr Phe
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                       215
Pro Ala Val Phe Ile Ala Ala Phe Ser Phe Ala Gly Ala Gln Phe Leu
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Ser Ser Asn Tyr Leu Gly Pro Glu Leu Pro Gly Ile Ile Ser Ala Leu
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                                    250
Val Ser Leu Val Ala Thr Ala Leu Phe Leu Lys Phe Trp Gln Pro Lys
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                                                    270
           260
Ala Ile Phe Arg Ser Asp Gly Lys Ala Ala Ser Phe Thr Lys Ser Asn
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                                                285
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His His Ile Cys Lys Ile Tyr Val Ala Trp Ser Pro Phe Val Ile Leu
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Val Leu Val Ile Val Leu Trp Ile Gln Pro Phe Phe Lys Ala Leu Phe
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                                        315
Glu Lys Asp Gly Leu Leu Ala Phe Ser Asn Phe Tyr Phe Glu Phe Asn
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Asn Ile Ser Asn His Ile Phe Lys Ser Pro Pro Phe Val Glu Ala Asn
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Arg Val Arg Val Ser Asp Ala Leu Ser Val Phe Gly Glu Thr Leu Lys
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Glu Met Arg Tyr Pro Ile Leu Thr Ile Gly Leu Val Leu Ser Phe Ala
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Tyr Val Ser Asn Tyr Ser Gly Ile Ser Ser Thr Leu Ala Leu Ala Leu
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Thr His Thr Gly Leu Ala Phe Thr Phe Phe Ser Pro Leu Ile Gly Trp
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Gly Ser Leu Gln Gln Leu Thr Ala Gln Arg Leu His Leu Pro Glu Val
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Leu Thr Leu Thr Ala Asn Thr Val Gly Gly Thr Leu Gly Lys Met Ile
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                485
Ser Pro Gln Ser Ile Ala Ile Ala Cys Ala Ala Val Gly Leu Ala Gly
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Lys Glu Ser Asp Leu Phe Lys Phe Thr Val Lys Tyr Ser Leu Ile Phe
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Glu Val Val Pro Ala Ile Lys
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Phe Leu Asn Asp His Ile Asn Val Phe Gly Leu Ile Ala Ala Leu Val
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att tta gtt tta acc atc tat gaa tcc agt tcg ctc att aaa gaa atg
                                                                      152
Ile Leu Val Leu Thr Ile Tyr Glu Ser Ser Leu Ile Lys Glu Met
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                         25
                                                                      200
cgc gac agc aaa tct caa ggt gag ctt gta gaa aat ggg cat ttg att
Arg Asp Ser Lys Ser Gln Gly Glu Leu Val Glu Asn Gly His Leu Ile
 35
                                                                      248
gat ggg ata ggg gag ttt gcc aat aat gtg cca gta ggc tgg atc gca
Asp Gly Ile Gly Glu Phe Ala Asn Asn Val Pro Val Gly Trp Ile Ala
                 55
                                                                      296
agc ttt atg tgc acg att gtg tgg gct ttt tgg tat ttc ttc ttt ggg
Ser Phe Met Cys Thr Ile Val Trp Ala Phe Trp Tyr Phe Phe Gly
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			70					75					80			
											tac Tyr					344
											aag Lys 110					392
aag Lys 115	gaa Glu	ctg Leu	gtg Val	gat Asp	atg Met 120	ggt Gly	caa Gln	ggc Gly	atc Ile	ttt Phe 125	tta Leu	gtc Val	cat His	tgt Cys	tcg Ser 130	440
caa Gln	tgc Cys	cat His	ggc Gly	atc Ile 135	acc Thr	gct Ala	gag Glu	ggc Gly	ttg Leu 140	cat His	ggg Gly	agc Ser	gct Ala	caa Gln 145	aat Asn	488
											gat Asp					536
											atg Met					584
											tat Tyr 190					632
											ctc Leu					680
											tgt Cys					728
											gcc Ala					776
											acg Thr					824
											aaa Lys 270					872
	caa Gln										cgc Arg	taa	aacco	ctt		918
aga	agati	taa a	agga	aaaga	ag at	tgaaa	attti	t taa	aacg	gatt	agc					961
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## <213> Helicobacter pylori

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Glu Met Arg Asp Ser Lys Ser Gln Gly Glu Leu Val Glu Asn Gly His
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Leu Ile Asp Gly Ile Gly Glu Phe Ala Asn Asn Val Pro Val Gly Trp
Ile Ala Ser Phe Met Cys Thr Ile Val Trp Ala Phe Trp Tyr Phe Phe
                                        75
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Phe Gly Tyr Pro Leu Asn Ser Phe Ser Gln Ile Gly Gln Tyr Asn Glu
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               85
Glu Val Lys Ala His Asn Gln Lys Phe Glu Ala Lys Trp Lys His Leu
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           100
Gly Gln Lys Glu Leu Val Asp Met Gly Gln Gly Ile Phe Leu Val His
                            120
                                                125
        115
Cys Ser Gln Cys His Gly Ile Thr Ala Glu Gly Leu His Gly Ser Ala
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Gln Asn Leu Val Arg Trp Gly Lys Glu Glu Gly Ile Met Asp Thr Ile
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                                        155
Lys His Gly Ser Lys Gly Met Asp Tyr Leu Ala Gly Glu Met Pro Ala
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                165
                                   170
Met Glu Leu Asp Glu Lys Asp Ala Lys Ala Ile Ala Ser Tyr Val Met
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                               185
Ala Glu Leu Ser Ser Val Lys Lys Thr Lys Asn Pro Gln Leu Ile Asp
                            200
                                                205
Lys Gly Lys Glu Leu Phe Glu Ser Met Gly Cys Thr Gly Cys His Gly
                       215
                                            220
Asn Asp Gly Lys Gly Leu Gln Glu Asn Gln Val Phe Ala Ala Asp Leu
                   230
                                       235
Thr Ala Tyr Gly Thr Glu Asn Phe Leu Arg Asn Ile Leu Thr His Gly
                                   250
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Lys Lys Gly Asn Ile Gly His Met Pro Ser Phe Lys Tyr Lys Asn Phe
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Ser Asp Leu Gln Val Lys Ala Leu Leu Asn Leu Ser Asn Arg
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Phe Leu Asn Gly Leu Ala Gly Asn Leu Leu Ile Val Val Ile Leu Leu
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56

104

Cys Val Ala Val Phe Phe Thr Leu Lys Ala Ile His Ile Gln Lys Glu 20 25 30	
caa gcc acc aat tat tac cgc tat aag gat att aac gct tta gag aca Gln Ala Thr Asn Tyr Tyr Arg Tyr Lys Asp Ile Asn Ala Leu Glu Thr $40$ $45$ $50$	200
aaa aac acc caa aac cgg gct aac tat gaa tta gtc aat caa ggg agt Lys Asn Thr Gln Asn Arg Ala Asn Tyr Glu Leu Val Asn Gln Gly Ser 55 60 65	248
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att	307
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atg agt aag gtt ttc cca aag ctc gct aaa gcg atc act cta gcg gca Met Ser Lys Val Phe Pro Lys Leu Ala Lys Ala Ile Thr Leu Ala Ala 20 25 30	152
aaa gat ggc ggg agc gaa ccg gac acg aac gcc aaa cta cga aca gcg Lys Asp Gly Gly Ser Glu Pro Asp Thr Asn Ala Lys Leu Arg Thr Ala 35 40 45 50	200

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gcg att aaa aga gcg agc agt aaa gaa ggg aat ttg agt gaa atc act Ala Ile Lys Arg Ala Ser Ser Lys Glu Gly Asn Leu Ser Glu Ile Thr 70 75 80	296
tat gaa ggt aag gcg aat ttt ggc gtg cta atc atc atg gaa tgc atg Tyr Glu Gly Lys Ala Asn Phe Gly Val Leu Ile Ile Met Glu Cys Met 85 90 95	344
act gat aac ccc acc aga acc att gcc aac ctt aaa agc tat ttc aat Thr Asp Asn Pro Thr Arg Thr Ile Ala Asn Leu Lys Ser Tyr Phe Asn 100 105 110	392
aaa acg caa ggg gca agc atc gtg cct aat ggc tct tta gag ttt atg Lys Thr Gln Gly Ala Ser Ile Val Pro Asn Gly Ser Leu Glu Phe Met 115 120 125 130	440
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tta aaa ctc agt cta gaa gat tta gaa ttc gct ctc att gat tat ggt Leu Lys Leu Ser Leu Glu Asp Leu Glu Phe Ala Leu Ile Asp Tyr Gly 150 155 160	536
ttg gaa gaa tta gaa gaa gtg gaa gac aag atc att att agg ggg gat Leu Glu Glu Leu Glu Glu Val Glu Asp Lys Ile Ile Ile Arg Gly Asp 165 170 175	584
tat aac agc ttc aag ctt tta aat gag ggg ttt gaa agc ttg aaa tta Tyr Asn Ser Phe Lys Leu Leu Asn Glu Gly Phe Glu Ser Leu Lys Leu 180 185 190	632
ccc att tta aaa gcg agt ttg caa cgc atc gcc aca acg ccc att gaa Pro Ile Leu Lys Ala Ser Leu Gln Arg Ile Ala Thr Thr Pro Ile Glu 195 200 205 210	680
ttg aat gac gaa caa atg gag ctt acc gaa aaa tta ctg gac agg att Leu Asn Asp Glu Gln Met Glu Leu Thr Glu Lys Leu Leu Asp Arg Ile 215 220 225	728
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<212> PRT

<213> Helicobacter pylori

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Thr Ala Ile Leu Asn Ala Lys Ala Gln Asn Met Pro Lys Asp Asn Ile
Asp Ala Ala Ile Lys Arg Ala Ser Ser Lys Glu Gly Asn Leu Ser Glu
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                    70
Ile Thr Tyr Glu Gly Lys Ala Asn Phe Gly Val Leu Ile Ile Met Glu
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                85
Cys Met Thr Asp Asn Pro Thr Arg Thr Ile Ala Asn Leu Lys Ser Tyr
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            100
                                105
Phe Asn Lys Thr Gln Gly Ala Ser Ile Val Pro Asn Gly Ser Leu Glu
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                            120
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Phe Met Phe Asn Arg Lys Ser Val Phe Glu Cys Leu Lys Asn Glu Val
                                            140
                       135
Glu Asn Leu Lys Leu Ser Leu Glu Asp Leu Glu Phe Ala Leu Ile Asp
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                    150
Tyr Gly Leu Glu Glu Leu Glu Glu Val Glu Asp Lys Ile Ile Ile Arg
                                    170
                165
Gly Asp Tyr Asn Ser Phe Lys Leu Leu Asn Glu Gly Phe Glu Ser Leu
                                                    190
                                185
Lys Leu Pro Ile Leu Lys Ala Ser Leu Gln Arg Ile Ala Thr Thr Pro
                           200
                                                205
Ile Glu Leu Asn Asp Glu Gln Met Glu Leu Thr Glu Lys Leu Leu Asp
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Arg Ile Glu Asp Asp Asp Val Val Ala Leu Tyr Thr Asn Ile Glu
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                                                     Met Val Val
gct aag aat gaa gac aac aaa aaa ttg tat gac atc att gac ggc cag
                                                                      164
Ala Lys Asn Glu Asp Asn Lys Lys Leu Tyr Asp Ile Ile Asp Gly Gln
     5
caa cga acg act acc atc ttc atg ctc ttg cat gtc ttg gcg aac aaa
                                                                      212
Gln Arg Thr Thr Thr Ile Phe Met Leu Leu His Val Leu Ala Asn Lys
 20
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ccc a Pro S																392
ttt t Phe L 1																440
gaa g Glu V 130																488
caa g Gln G	-	_		_		-		-		-	_		_	_		536
gct t Ala S		_					_	_						_	_	584
ggc a Gly M	_		_	_	_	_		_		_	_		_	_	_	632
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		35					40					45			Tyr	
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aac Asn	atg Met	ctc Leu	tta Leu	gtc Val	gtg Val	gcg Ala	gtg Val	gtt Val	tta Leu	tac Tyr	acg Thr	cat His	aat Asn	tta Leu	gcg Ala	1160

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1208

11e Gly Val Val Val Gly Val Leu Val Asn Ala Leu Trp Ile Lys Ser

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Val Ala Phe Tyr Thr Thr Phe Tyr Met Ala Phe Val Leu Ser Leu Phe

50 55 60 Gly Ala Arg Lys Ala Met Ile Ser Ala Ala Ala Gly Ser Val Ala Leu 65 70 75 80

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Val Asn Ala Leu Gly Ile Leu Leu Met Glu Gln Phe Lys Phe Leu 130 135 140

Gln Asn Gln Asn Leu Gly Val Phe Val Leu Leu Ala Ile Gly Ile Leu
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Ile Ile Tyr Leu Phe Pro Leu Ile Thr Lys Lys Ile Pro Ser Asn Leu 165 170 175 Ile Cys Ile Leu Ile Val Ser Ala Ile Ala Leu Ile Phe Asp Met His

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Pro Tyr Ala Leu Ser Leu Ala Leu Val Gly Thr Ile Glu Ser Leu Leu

225 230 235 240
Thr Ala Lys Thr Leu Asp Val Ile Leu Lys Asp Gly Val Ser Asp Lys

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Asn Lys Glu Thr Lys Ala Gln Gly Leu Gly Asn Ile Ile Ser Gly Leu

Asn Lys Glu Thr Lys Ala Gin Gly Leu Gly Asn lie lie Ser Gly Leu 260 265 270

Leu Gly Gly Met Thr Gly Cys Ala Leu Val Gly Gln Ser Ile Ile Asn 275 280 285

Ala Lys Ser Gly Ala Lys Thr Arg Leu Ser Thr Phe Phe Ala Gly Phe 290 295 300

Ser Leu Met Val Leu Ile Leu Val Phe Asn Glu Tyr Val Val Lys Ile 305 310 315 320

Pro Ile Val Ala Val Val Ala Val Met Val Met Ile Ser Phe Thr Thr

Phe	Asn	Phe		325 Ser	Ile	Ile	Asn	Ile	330 Lys	Lys	Ile	Lys	Leu	335 Tyr	Asp	
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ggc Gly 10	acg Thr	act Thr	tct Ser	tta Leu	agg Arg 15	cgc Arg	tct Ser	atg Met	cag Gln	atc Ile 20	aaa Lys	tta Leu	aag Lys	cgc Arg	cag Gln 25	460
gat Asp	ttg Leu	gac Asp	aca Thr	gaa Glu 30	agc Ser	ttg Leu	aga Arg	ggg Gly	aat Asn 35	gtc Val	caa Gln	acc Thr	cgt Arg	ttg Leu 40	aaa Lys	508
aag Lys	ctt Leu	gaa Glu	tgc Cys 45	gga Gly	gaa Glu	ttt Phe	gac Asp	gct Ala 50	atc Ile	att Ile	tta Leu	gct Ala	gaa Glu 55	gcc Ala	ggg Gly	556
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gta Val	gaa Glu 75	Glu	atg Met	att Ile	cct Pro	agc Ser 80	atg Met	ggt Gly	cag Gln	gly	gct Ala 85	tta Leu	ggg	gta Val	gaa Glu	652
atg Met 90	ctc Leu	aaa Lys	aac Asn	cac His	aag Lys 95	cat His	ttt Phe	gcc Ala	acg Thr	ctt Leu 100	Gln	aaa Lys	ctc Leu	aac Asn	gac Asp 105	700
gag Glu	aaa Lys	agc Ser	gcg Ala	ttt Phe 110	tgc Cys	tgc Cys	cgt Arg	tta Leu	gaa Glu 115	Arg	gag Glu	ttt Phe	ato : Ile	aag Lys 120	GLY	748
ctt	aat	gga	ggg	tgt	cag	atc	cct	ata	gga	gtg	cat	gcg	, agt	: tta	atg	796

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Glu Val Ile Thr Lys Glu Lys Gln Gly Asp Lys Thr Lys Ala Phe Asp
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    155
                                                                      940
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att tta gaa aag gcg cag ttg ttt taatgcgttt gtttatcgcg ctagttttgt
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Gly Ala Lys Tyr Arg Lys Ala Phe Ser Val Glu Glu Met Ile Pro Ser
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tct tgg gcg gat ttc atc acg gaa ttt cgt gtg gat ttg ata gag atg Ser Trp Ala Asp Phe Ile Thr Glu Phe Arg Val Asp Leu Ile Glu Met 20 25 30	152
gac ggg caa ttg ctt gta act ttt aat gaa att agc ggc aat ttc ggt Asp Gly Gln Leu Leu Val Thr Phe Asn Glu Ile Ser Gly Asn Phe Gly 35 40 45 50	200
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15 20 25

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gto Val	agc Ser 95	gac Asp	aga Arg	gcc Ala	cat His	gtg Val 100	atc Ile	ttg Leu	ccc Pro	tat Tyr	cat His 105	gcc Ala	aaa Lys	aaa Lys	gac Asp	39	99
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ag Se	c gca r Ala	tgo Cys 240	. Val	g ago . Ser	acc Thr	ggc	tta Lei 245	ı Asr	cct Pro	aaa Lys	a gcg s Ala	g ato a Ile 250	e Asr	gaa Glu	a gtc 1 Val	8	331
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			cct gaa gag ttt at Pro Glu Glu Phe Il 190	
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	ttg Leu 260															872
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	ttt Phe															1016
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	_				cac His		_		_				-	-		780
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1208

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305

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310

70

85

100

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-		-														
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tct ser tca ser 35	ttg Leu 20 agc Ser	Gly 5 atc Ile gtt Val gcg	Leu att Ile tta Leu caa	cta Leu cct Pro	yal gga Gly gaa Glu 40	gcg Ala 25 ttg Leu	Leu 10 ata Ile cat His	gtc Val ctg Leu	gcg Ala act Thr	ccc Pro ccc Pro 45	Gly att Ile 30 ttt Phe gtt	Ile 15 gtt Val gag Glu tta	ttc Phe agc Ser	ggc Gly aaa Lys ggg Gly	ggc Gly gct Ala aaa Lys 50	104 152
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75

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Leu Leu Phe Val Phe Tyr Tyr Thr Pro Tyr Ile Leu Asn Ala Gln Lys

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90

105

80

344

392

440

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872

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gtg Val	cac His	gaa Glu 325	aat Asn	ttt Phe	ttg Leu	cat His	tta Leu 330	ggg Gly	gta Val	gly ggg	agt Ser	ggg Gly 335	gta Val	act Thr	tat Tyr	1064
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tta Leu 435	. Lys	ago Ser	cta Leu	gaa Glu	atc Ile 440	cgt Arg	ttg Leu	agt Ser	gaa Glu	gcc Ala 445	. Pro	att Ile	gat Asp	aaa Lys	cgc Arg 450	1400
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65 Glu	His	Ala	Phe	Tyr	70 Pro	Lys	Ile	His	Ser		Leu	Asp	Gln	Lys		
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		195					200	l				205				
	210					215					220				Arg	
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Pro	Leu	. Lys	Thr	245 Ser	Lev	ı Phe	e Glu	ı Ile	250 Phe		s Ala	Let	ı Phe		Cys	
			260	)				265	5				270	)		
Gly	/ Ser	Val	. Thr	GL <sub>y</sub>	, Cys	s Pro	ν гλε	• TTE	: n\z	, 111I	. met	. 411		~ <u>+ +</u> C	e Glu	

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Thr Tyr Lys Ser Lys Ala Pro Lys Glu Tyr Glu Glu Ser Phe Leu Lys
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Ala Leu Asn Gly Thr Gly Val Val Gly Leu Leu Lys Lys Gly Leu Val
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Ser Phe Arg Glu Phe Ile Gln Gln Phe Lys Lys Asn Lys Ala Ala Val
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											atg Met					344
			-								tat Tyr 110					392
	-	_			_	_		_	_		atg Met		_	_		440
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_	_		-	_					-		gaa Glu		_		-	584
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		_						_			gcg Ala	_	_	-		776
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	_				_	_	_	_			ctg Leu 270	_		_		872

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925

958

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aac tat caa acc ggt tac acc aat att ata act agc gtt aat agc gtt Asn Tyr Gln Thr Gly Tyr Thr Asn Ile Ile Thr Ser Val Asn Ser Val 25 30 35	211
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Gly Ile Gly Leu Val Met Gly Tyr Asn His Phe Phe His Pro Asp Lys
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Ile Leu Gly Leu Arg Tyr Phe Ala Phe Leu Asp Trp Gln Gly Tyr Gly
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                                        75
Met Arg Tyr Pro Lys Gly Tyr Tyr Gly Gly Asn Asn Met Ile Thr Tyr
                85
                                    90
Gly Val Gly Val Asp Ala Val Trp Asn Phe Phe Gln Gly Ser Phe Tyr
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            100
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Gln Asp Asp Ile Ser Val Asp Ile Gly Val Phe Gly Gly Ile Ala Ile
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                                                125
Ala Gly Asn Ser Trp Tyr Ile Gly Ser Lys Gly Gln Glu Leu Leu Gly
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Ile Thr Asn Ser Ser Ala Val Asp Asn Thr Ser Phe Gln Phe Leu Phe
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Asn Phe Gly Leu Lys Ala Leu Phe Val Asp Glu His Glu Phe Glu Ile
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Gly Phe Lys Phe Pro Thr Ile Asn Asn Lys Tyr Tyr Thr Thr Asp Ala
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Leu Lys Val Gln Met Arg Arg Val Phe Ala Phe Tyr Val Gly Tyr Asn
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Tyr His Phe
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                                                                      104
Gly Gly Thr Val Lys Lys Asp Leu Lys Lys Ala Ile Gln Tyr Tyr
                                                                      152
gtt aaa gcg tgt gaa ttg aat gaa atg ttt ggg tgt ctg tca tta gtt
Val Lys Ala Cys Glu Leu Asn Glu Met Phe Gly Cys Leu Ser Leu Val
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                         25
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tcg aac tct caa ata aac aaa caa aaa ctc ttt caa tat ctc tct aaa
Ser Asn Ser Gln Ile Asn Lys Gln Lys Leu Phe Gln Tyr Leu Ser Lys
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35					40					45					50	
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	_										aga Arg					296
											gat Asp					344
											gtc Val 110					392
											tta Leu					440
						aac Asn		taga	atttç	gaa a	ataaa	atgci	ig ti	cttt	tagct	494
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1			_	5					10					15		
	_		20					25			Phe		30			
Leu	Val	Ser 35	Asn	Ser	Gln	Ile	Asn 40	Lys	Gln	Lys	Leu	Phe 45	Gln	Tyr	Leu	
Ser	Lys 50	Ala	Cys	Glu	Leu	Asn 55	Ser	Gly	Asn	Gly	Cys 60	Arg	Phe	Leu	Gly	
Asp 65	Phe	Tyr	Glu	Asn	Gly 70	Lys	Tyr	Val	Lys	Lys 75	Asp	Leu	Arg	Lys	Ala 80	
	Gln	Tyr	Tyr			Ala	Cys	Gly			Asp	Gln	Asp	Gly 95		
Leu	Ile	Leu		85 Tyr	Lys	Gln	Tyr		90 Gly	Lys	Gly	Val			Asn	
Glu	Lys		100 Ala	Val	Lys	Thr		105 Glu	Lys	Ala	Cys		110 Leu	Gly	Ser	
Glu	Asp 130	115 Ala	Cys	Gly	Ile	Leu 135	120 Asn	Asn	Tyr			125				
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                                                      Asn Pro Gln
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age ttt ttc agg aat acg cca cat ttt ttg atc agc cga att ttt atc
Ser Phe Phe Arg Asn Thr Pro His Phe Leu Ile Ser Arg Ile Phe Ile
cac cag cat gag aat aaa aat cag aat att gac tat gag caa cca aac
                                                                      154
His Gln His Glu Asn Lys Asn Gln Asn Ile Asp Tyr Glu Gln Pro Asn
gat aga agc aaa ttc cac gct cac cct ttc aag agc gtt tta aca acc
                                                                      202
Asp Arg Ser Lys Phe His Ala His Pro Phe Lys Ser Val Leu Thr Thr
caa acg cta cca ctt ggt ttt tta gag aga gaa aga gag aga aag caa
                                                                      250
Gln Thr Leu Pro Leu Gly Phe Leu Glu Arg Glu Arg Glu Arg Lys Gln
aat ttt aag att gat tct caa atc tat tcc ttt gca aaa gtt aag att
                                                                      298
Asn Phe Lys Ile Asp Ser Gln Ile Tyr Ser Phe Ala Lys Val Lys Ile
ggg tgt ttt aac atg att ttt ggc ctg ctc gca tca agc cct tat ttt
                                                                      346
Gly Cys Phe Asn Met Ile Phe Gly Leu Leu Ala Ser Ser Pro Tyr Phe
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Ile Phe Ile His Gln His Glu Asn Lys Asn Gln Asn Ile Asp Tyr Glu
            20
                                25
Gln Pro Asn Asp Arg Ser Lys Phe His Ala His Pro Phe Lys Ser Val
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			g ttc tat ttc tcg s Phe Tyr Phe Ser 30	
			t tgt agc tat att a Cys Ser Tyr Ile 45	
			g tgt ttc gtg aat s Cys Phe Val Asn )	
			a ata atg gta att o Ile Met Val Ile 80	
			a tcc atc gtc tat e Ser Ile Val Tyr 95	
			gtt ttt tgc act Val Phe Cys Thr 110	
		-	a aaa aat gct caa 1 Lys Asn Ala Gln 125	
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Leu Val Phe Val Leu Leu Ile Leu Gly Ile Val Ala Cys Ser Tyr Ile
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Ser Leu Lys Met His Gln Arg Lys Cys Phe Ala Lys Cys Phe Val Asn
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Ser Glu Ser Phe Leu Ser Lys Met Leu His Ser Pro Ile Met Val Ile
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                    70
Cys Phe Tyr Phe Ile Phe Ser Ile Phe Thr Ser Ile Ser Ile Val Tyr
                                     90
                85
Ser Val Leu Asp Tyr Asp Gln Met Met Trp Gly Phe Val Phe Cys Thr
                                105
                                                     110
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                                                                       104
Arg Arg Arg Asn Arg Gly Asp Ala Ser Gly Thr Gly Leu Asp Lys Leu
                                                                       152
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Ile Asp Ala Xaa Pro Leu Arg Phe Phe Asp Val Ala Ile Ala Glu Gln
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cac gct tta act tct agc agc gct atg gct aaa gag ggg ttt aaa cct
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His Ala Leu Thr Ser Ser Ser Ala Met Ala Lys Glu Gly Phe Lys Pro
 35
                                                                       248
ttt gtg agc atc tat tct act ttt ttg cag agg gct tat gat tct att
Phe Val Ser Ile Tyr Ser Thr Phe Leu Gln Arg Ala Tyr Asp Ser Ile
                 55
                                                                       296
gtg cat gac gct tgt att tct agc ttg ccg att aaa tta gcc att gac
Val His Asp Ala Cys Ile Ser Ser Leu Pro Ile Lys Leu Ala Ile Asp
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cga gac aat gag act tta aaa aac gcc gtg cgt ttt gcc aat gaa cac Arg Asp Asn Glu Thr Leu Lys Asn Ala Val Arg Phe Ala Asn Glu His 115 120 125 130	440
gat tca agc cct tgc gcg ttc cga tac cct agg ggg tcg ttt gcg tta Asp Ser Ser Pro Cys Ala Phe Arg Tyr Pro Arg Gly Ser Phe Ala Leu 135 140 145	488
aaa gag ggg gtt ttt gag cct agc ggt ttt gtt tta ggc caa agc gaa Lys Glu Gly Val Phe Glu Pro Ser Gly Phe Val Leu Gly Gln Ser Glu 150 155 160	536
ttg ttg aaa aaa gag ggc gaa att tta ctc ata ggc tat ggt aat ggc Leu Leu Lys Lys Glu Gly Glu Ile Leu Leu Ile Gly Tyr Gly Asn Gly 165 170 175	584
gtg ggg cgg gcg cat tta gtc caa ctg gct tta aaa gaa aaa aac ata Val Gly Arg Ala His Leu Val Gln Leu Ala Leu Lys Glu Lys Asn Ile 180 185 190	632
gaa tgc gct ctc ttg gat ctc agg ttt tta aag cct tta gat cca aat Glu Cys Ala Leu Leu Asp Leu Arg Phe Leu Lys Pro Leu Asp Pro Asn 200 205 210	680
tta agc gcg atc gtt gcc cct tat caa aag ctc tat gtt ttt agc gat Leu Ser Ala Ile Val Ala Pro Tyr Gln Lys Leu Tyr Val Phe Ser Asp 215 220 225	728
aat tac aag ctt gga ggg gtg gct agc gcg att tta gag ttt ttg agc Asn Tyr Lys Leu Gly Gly Val Ala Ser Ala Ile Leu Glu Phe Leu Ser 230 235 240	776
gaa caa aat att tta aag cct gtt aaa agc ttt gaa atc att gat gaa Glu Gln Asn Ile Leu Lys Pro Val Lys Ser Phe Glu Ile Ile Asp Glu 245 250 255	824
ttt atc atg cat ggg aac acc gct tta gtg gaa aaa tcc tta gga tta Phe Ile Met His Gly Asn Thr Ala Leu Val Glu Lys Ser Leu Gly Leu 260 265 270	872
gac aca gag agt ttg act gac gct att tta aaa gat tta gga caa gag Asp Thr Glu Ser Leu Thr Asp Ala Ile Leu Lys Asp Leu Gly Gln Glu 275 280 285 290	920
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Lys Pro Phe Val Ser Ile Tyr Ser Thr Phe Leu Gln Arg Ala Tyr Asp
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Ser Ile Val His Asp Ala Cys Ile Ser Ser Leu Pro Ile Lys Leu Ala
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Ile Asp Arg Ala Gly Ile Val Gly Glu Asp Gly Glu Thr His Gln Gly
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Ser Glu Leu Leu Lys Lys Glu Gly Glu Ile Leu Leu Ile Gly Tyr Gly
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                                   170
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Asn Gly Val Gly Arg Ala His Leu Val Gln Leu Ala Leu Lys Glu Lys
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Asn Ile Glu Cys Ala Leu Leu Asp Leu Arg Phe Leu Lys Pro Leu Asp
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                                                205
Pro Asn Leu Ser Ala Ile Val Ala Pro Tyr Gln Lys Leu Tyr Val Phe
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                                           220
Ser Asp Asn Tyr Lys Leu Gly Gly Val Ala Ser Ala Ile Leu Glu Phe
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Leu Ser Glu Gln Asn Ile Leu Lys Pro Val Lys Ser Phe Glu Ile Ile
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                245
Asp Glu Phe Ile Met His Gly Asn Thr Ala Leu Val Glu Lys Ser Leu
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                                                    270
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                                                                      104
Leu Leu Phe Thr Gly Ala Cys Gly Tyr Ile Gly Ser His Thr Ala Arg
gcg ttt tta gaa aaa acc aaa gaa aat atc att att gta gat gac tta
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gac Asp	gcc Ala	ttt Phe	ttg Leu 70	aat Asn	aag Lys	cag Gln	cag Gln	cta Leu 75	aaa Lys	gat Asp	ccc Pro	att Ile	gaa Glu 80	gcc Ala	atc Ile	296
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ctt Leu 115	tgc Cys	tta Leu	aaa Lys	cat His	gca Ala 120	atc Ile	aag Lys	cgt Arg	ttt Phe	att Ile 125	ttt Phe	tct Ser	tct Ser	acg Thr	gcc Ala 130	440
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tat Tyr	ttc Phe 180	Asn	Val	Ala	ggg Gly	Ala	Cys	Met	His	Asn	gat Asp 190	Tyr	acc Thr	acc Thr	cct Pro	632
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gta Val	gat Asp	gat Asp 245	ttg Leu	gct Ala	aac Asn	gca Ala	cat His 250	Leu	gcg Ala	agc Ser	tat Tyr	caa Gln 255	acc Thr	ctt Leu	tta Leu	824

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	gtg Val															920
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tat Tyr	aac Asn	aac Asn 325	cta Leu	gac Asp	acc Thr	att Ile	atc Ile 330	aaa Lys	agc Ser	gct Ala	cta Leu	gat Asp 335	tgg Trp	gaa Glu	gaa Glu	1064
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1 Ala Asp Tyr Lys 65 Ala Leu Val	Ala Arg Leu Pro 50 Leu Ile Pro Lys Ala	Leu Ala Ser 35 Asn Asp Leu Leu Leu 115	Phe 20 Thr Arg Ala His Glu 100 Cys	5 Leu Gly Val Phe Phe 85 Tyr Leu	Glu Phe Val Leu 70 Gly Tyr	Lys Leu Phe 55 Asn Ala Thr His	Thr Glu 40 Ile Lys Lys Asn Ala 120	Lys 25 His Gln Gln Ile Asn 105 Ile	10 Glu Leu Ala Gln Ser 90 Thr	Asn Lys Asn Leu 75 Val Leu Arg	Ile Ala Leu 60 Lys Glu Asn Phe Leu	Ile Leu 45 Asn Asp Glu Thr Ile 125	Ile 30 Glu Glu Pro Ser Leu 110 Phe	15 Val His Thr Ile Thr 95 Glu Ser	Asp Tyr His Glu 80 His Leu Ser	
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F	he	210 Glv	Thr	Asn	Ͳvr	Pro	215 Thr	Ara	Asp	Glv	Thr	220 Cys	Ile	Arq	Asp	Tyr	
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	_		275			Glu		280					285				
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	aaa Lys	att Ile	tac Tyr	aac Asn 10	ccc Pro	aat Asn	tct Ser	aca Thr	gaa Glu 15	agt Ser	gtg Val	aat Asn	gaa Glu	aga Arg 20	aag Lys	att Ile	162
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105 110 115

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Arg Asp Tyr Leu Lys Leu Ser Ala Glu Glu Lys Ile Gly Tyr Asp Arg
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Ala Leu Ala Gln Leu Ile Phe Met Asp Ser Leu Gln Ala Asn Asn Leu
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Ile Asp Asn Ile Asn Pro Phe Ile Thr Ser Pro Glu Ile Asn Leu Cys
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Val Met Val Glu Ser Ile Ser Ala Asn Thr Glu Glu Ile Tyr Asp Met
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Trp Arg Asn Asp Met Gln Leu Lys Ser Lys Asn Asp Tyr Ile Ala Gln
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Val Tyr Met Glu Leu Ala Lys Asn Pro Thr Glu Glu Asn Ile Leu Lys
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Ala Leu Phe Ala Asn Gln Ile Leu Glu Gly Ile Tyr Phe Tyr Ser Gly
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Phe Ser Tyr Phe Tyr Thr Leu Ala Arg Ser Gly Lys Met Leu Gly Ser
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Ala Gln Met Ile Arg Phe Ile Gln Arg Asp Glu Val Thr His Leu Ile
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Leu Phe Gln Asn Met Ile Asn Ala Leu Arg Asn Glu Arg Ala Asp Leu
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Phe Thr Pro Gln Leu Ile Asn Glu Val Ile Gly Met Phe Lys Lys Ala
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Val Glu Ile Glu Ala Leu Trp Gly Asp Tyr Ile Thr Gln Gly Lys Ile
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Leu Gly Leu Thr Ser Ser Leu Ile Glu Gln Tyr Ile Gln Phe Leu Ala
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Asp Ser Arg Leu Ser Lys Val Gly Ile Ala Lys Val Tyr Gly Val Gln
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His Pro Ile Lys Trp Val Glu Ser Phe Ser Ser Phe Asn Glu Gln Arg
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ctc att gag tgg atg att aaa atc gct caa ggc gaa aaa ttg ccc aag Leu Ile Glu Trp Met Ile Lys Ile Ala Gln Gly Glu Lys Leu Pro Lys 30 35 40	267
caa gaa agc ttt tct ctc aaa ggg cat gcg ata gaa tgc cga atc acg Gln Glu Ser Phe Ser Leu Lys Gly His Ala Ile Glu Cys Arg Ile Thr 45 50 55	315
gca gaa gat cct aaa aaa ttc tac cca agc ccg ggc aaa att acc gaa Ala Glu Asp Pro Lys Lys Phe Tyr Pro Ser Pro Gly Lys Ile Thr Glu 60 65 70 75	363
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gcc aat tat gtc gtg cct acg cac tat gat tcg atg att ggc aag ctc Ala Asn Tyr Val Val Pro Thr His Tyr Asp Ser Met Ile Gly Lys Leu 95 100 105	459
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cac ctt gaa atg ctt gaa aat gcg gat ttc agg caa gca aaa atc cac His Leu Glu Met Leu Glu Asn Ala Asp Phe Arg Gln Ala Lys Ile His 140 145 150	603
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	50		His			55					60					
65			Pro		70					75					80	
			Val	85					90					95		
			Tyr 100					105					110			
		115	Arg				120					125				
_	130		Gly			135					140					
145			Asp	Phe	Arg 150	Gln	Ala	Lys	lle	155	Thr	ьуs	Tyr	ьeu	160	
Glu	Asn	Pne														
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aac	gagt	att '	tgca	caat	ga a	ctcca	aaaa	g cti	cttag	gaaa	aaa	tete	atc a		ttc Phe	56
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100 105 110

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1 Phe	Gln Lys	Glu	Val	5					10					15		
		Glu Ile	Val Glu 20	5 Lys	Gly	Leu	Val	Lys 25	10 Val	Cys	His	Gly	Lys 30	15 Asn	Pro	
Ser	Lys Leu Leu	Glu Ile Leu 35	Val Glu 20 Glu	5 Lys Ile	Gly Val	Leu Gln Pro	Val Ser 40	Lys 25 Val	10 Val Arg	Cys Asp	His Lys	Gly Gly 45	Lys 30 Tyr	15 Asn Arg	Pro Gly	
Ser Pro Leu	Lys Leu	Glu Ile Leu 35 Leu	Val Glu 20 Glu Val	5 Lys Ile Arg	Gly Val Phe	Leu Gln Pro 55	Val Ser 40 His	Lys 25 Val Leu	10 Val Arg Val	Cys Asp Gln	His Lys Lys 60	Gly Gly 45 Gln	Lys 30 Tyr Ile	15 Asn Arg Lys	Pro Gly Ser	
Ser Pro Leu 65	Lys Leu Leu 50	Glu Ile Leu 35 Leu Asp	Val Glu 20 Glu Val Ala	5 Lys Ile Arg Phe	Gly Val Phe Ser 70	Leu Gln Pro 55 Ser	Val Ser 40 His	Lys 25 Val Leu Ile	10 Val Arg Val Lys	Cys Asp Gln Glu 75	His Lys Lys 60 Tyr	Gly Gly 45 Gln	Lys 30 Tyr Ile Tyr	15 Asn Arg Lys Ser	Pro Gly Ser Gly 80	
Ser Pro Leu 65 Ala	Lys Leu Leu 50 Phe	Glu Ile Leu 35 Leu Asp	Val Glu 20 Glu Val Ala Ala	5 Lys Ile Arg Phe Val 85	Gly Val Phe Ser 70 Phe	Leu Gln Pro 55 Ser Pro	Val Ser 40 His Ala Leu	Lys 25 Val Leu Ile	10 Val Arg Val Lys Val 90	Cys Asp Gln Glu 75 Asn	His Lys Lys 60 Tyr	Gly Gly 45 Gln Gln Met	Lys 30 Tyr Ile Tyr	15 Asn Arg Lys Ser Ser 95	Pro Gly Ser Gly 80 Phe	
Ser Pro Leu 65 Ala Val	Lys Leu Leu 50 Phe	Glu Ile Leu 35 Leu Asp Lys Pro	Val Glu 20 Glu Val Ala Ala Leu 100	5 Lys Ile Arg Phe Val 85 Val	Gly Val Phe Ser 70 Phe Gln	Leu Gln Pro 55 Ser Pro Gly	Val Ser 40 His Ala Leu Ala	Lys 25 Val Leu Ile Lys Lys 105	10 Val Arg Val Lys Val 90 Gly	Cys Asp Gln Glu 75 Asn Leu	His Lys Lys 60 Tyr Gln Asn	Gly 45 Gln Gln Met	Lys 30 Tyr Ile Tyr Pro Gly 110	15 Asn Arg Lys Ser Ser 95 Leu	Pro Gly Ser Gly 80 Phe Glu	

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Leu Gly Phe Ile Ala Lys Ser Met Gln His Glu Ile Thr Leu Thr Ile
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Glu Gly Leu Asn Glu Leu Lys Thr Ile Ile Ala Val Ala Lys Gln Asn
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Glu Phe Leu Ala Cys Pro Lys Ile Gly Ile Arg Ile Arg Leu His Ser
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Thr Gly Thr Gly Val Trp Ala Lys Ser Gly Gly Ile Asn Ser Lys Phe
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Gly Leu Ser Ser Thr Glu Val Leu Glu Ala Met Arg Leu Leu Glu Glu
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Asn Asp Leu Leu Glu His Phe His Met Ile His Phe His Ile Gly Ser
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Asn Leu Tyr Ala Glu Leu Arg Lys Met Gly Ala Lys Asn Leu Asn Ser
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Val Asn Ile Gly Gly Gly Leu Ala Val Glu Tyr Thr Gln His Lys His
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His Gln Asp Lys Asn Tyr Thr Leu Glu Glu Phe Ser Ala Asp Val Val
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Phe Leu Leu Arg Glu Ile Val Lys Asn Lys Gln Glu Ile Glu Pro Asp
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Val Ala Pro Val Leu Glu Leu Phe Ser His Glu Tyr Asn Glu Lys Ser
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Leu Lys Ile Lys Glu Asn Asn Asn Pro Pro Leu Ile Asp Glu Met Leu
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Asp Leu Leu Ala Asn Ile Asn Glu Lys Asn Ala Ile Glu Tyr Leu His
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Asp Ser Phe Asp His Thr Glu Ser Leu Phe Thr Leu Phe Asp Leu Gly
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Tyr Ile Asp Leu Ile Asp Arg Ser Asn Thr Glu Val Leu Ala His Leu
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Ser Leu Trp Asp Ile Thr Cys Asp Ser Asp Gly Glu Ile Ala Phe Asp
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                                                      495
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Ser Thr Lys Pro Leu Phe Leu His Asp Ile Asp Ile Asp Glu Glu Glu
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                                                  510
Tyr Phe Leu Ala Phe Phe Leu Val Gly Ala Tyr Gln Glu Val Leu Gly
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Met Lys His Asn Leu Phe Thr His Leu Arg Asn Leu Ala Trp Phe Leu
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		tta Leu 5														104
tta Leu	acc Thr 20	aaa Lys	aga Arg	gtt Val	aga Arg	aag Lys 25	aag Lys	att Ile	ttt Phe	aag Lys	aat Asn 30	gat Asp	ccc Pro	aca Thr	gaa Glu	152
aat Asn 35	caa Gln	aaa Lys	aaa Lys	gcc Ala	ata Ile 40	aag Lys	atc Ile	gct Ala	cta Leu	aat Asn 45	acc Thr	cct Pro	gat Asp	att Ile	gct Ala 50	200
		caa Gln														248
		gag Glu														296
		att Ile 85														344
cgt Arg	gag Glu 100	cgc Arg	atc Ile	aaa Lys	gta Val	ggg Gly 105	gga Gly	ttg Leu	ccc Pro	act Thr	ttt Phe 110	aaa Lys	ttt Phe	ggt Gly	gct Ala	392
aaa Lys 115	aaa Lys	aat Asn	gct Ala	aaa Lys	gaa Glu 120	gaa Glu	caa Gln	tac Tyr	aag Lys	caa Gln 125	gat Asp	gaa Glu	aga Arg	ttg Leu	aat Asn 130	440
		ttg Leu														488
aaa Lys	ctg Leu	caa Gln	aaa Lys 150	tta Leu	ggg	gat Asp	tat Tyr	gaa Glu 155	aat Asn	ata Ile	gaa Glu	aaa Lys	att Ile 160	ttg Leu	gat Asp	536
		gaa Glu 165														584
		tta Leu											taa	ttct	tct	633
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Ile Ala Ile Ile Gln Gly Pro Pro Gly Thr Gly Lys Thr Thr Val Ile
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                                    90
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                                                    110
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                   150
Leu Asp Leu Glu Glu Ala Leu Arg Arg Tyr Tyr Ser Ser Pro Ile Ser
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                            Met Gln Glu Arg Val Phe Lys Arg Lys
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Val Leu Asp Ala Asn Ile Leu Lys Glu Met His Ala Asn Asn Val Cys
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tat tcc aag cat tca aaa gat agg ttt att cct ttc aaa ttt gat aaa
                                                                      208
Tyr Ser Lys His Ser Lys Asp Arg Phe Ile Pro Phe Lys Phe Asp Lys
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ttt ggt tat gtt gga tgt aaa ctt ttt aaa aag ata tta aac ttt cct
                                                                      256
Phe Gly Tyr Val Gly Cys Lys Leu Phe Lys Lys Ile Leu Asn Phe Pro
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age aat aca act tte ttt ggt gge aca ggt tgt aag aaa ete atg gaa
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Ser	Asn	Thr 60	Thr	Phe	Phe	Gly	Gly 65	Thr	Gly	Cys	Lys	Lys 70	Leu	Met	Glu		
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													aga Arg			40	00
_								_					act Thr	_		44	48
													ttc Phe 135			49	96
	_			_				_				_	aat Asn			54	44
	-												ctc Leu			59	92
			_	_	_				-		_		ggt Gly	-		64	40
	_				_				~				aac Asn			68	88
													tat Tyr 215			73	36
		_			_								aag Lys	_		78	34
			_		_		_				-	~	tta Leu	~	•	83	32
	tct Ser		-		_			_		taaa	agaag	gac a	aaagg	gataa	aa	88	32
aatg	gcaat	tc d	ccact	caaa	aa aa	agatt	taag	ја								91	13
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Leu Phe Lys Lys Ile Leu Asn Phe Pro Ser Asn Thr Thr Phe Phe Gly
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Asp Ser Arg Ser Ser Lys Ile Ala Leu Asn Arg His Tyr Ala Leu Thr
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                                    90
Arg Leu Gln Trp Cys Asp Arg Thr Leu Arg His Asn Leu Gln Ile Leu
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Glu Arg Ile Gly Phe Leu Thr Ala Phe Lys Asn Lys Lys Gly Tyr Ile
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Phe Leu Ser Met His Asp Phe Thr Lys Ile Glu Asn Tyr Glu His Ser
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                                            140
Gly Leu Asn Gly Glu Ser Asn Leu Pro Asn Ser Phe Phe Leu Gly Ile
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                                       155
Cys Gly Tyr Leu Lys Lys Leu Phe Lys Lys Leu Lys Asp Arg Ala Phe
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                165
Arg Leu Ala Asn Lys His Gly Val Phe Phe Leu Lys Ile Pro Lys His
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Phe Gln Met Gln Asn Phe Asn Asn Ile Phe Leu Glu Phe Val Ser Val
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                                                205
Asn Asn Pro Cys Phe Ser Tyr Arg Leu Thr Tyr Asp Gln Leu Val Gly
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                                            220
Lys Lys Ile Pro Asn Ile Lys Cys Ser Tyr Gln Gln Ala Ile Val Lys
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                                                                      104
Leu Glu Glu Leu Tyr Ala Pro Asn His Ile Glu Arg Leu Lys Ala Arg
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                                                                      152
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Ser Phe Leu Arg Ser Ile Ala Phe Phe Asp Asp Phe Ser Ala Ser Phe
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                                                                      200
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Glu Tyr Arg Asp Leu Phe Ser Val Leu Glu Asn Ile Val Gln Phe Asp
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			_		_	_			-					aat Asn		296
	_					_			_	_	_		_	ttt Phe	_	344
-		_		_	-		-	_	-		-	-		ttg Leu		392
														gtg Val		440
_		_		-					-	_				gaa Glu 145		488
	_					_			_			_	_	ttt Phe	_	536
~ ~				_			_			-			_	gcc Ala		584
														cat His		632
_	_				_				-		-			tat Tyr	_	680
														gag Glu 225		728
			_									-		acg Thr		776
	_		~		_								_	ttt Phe		824
				_		_	-	_	_					gag Glu		872
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Phe 275	Glu	Asn	Glu	Leu	Arg 280	Gln	Pro	Ile	Asn	Leu 285	Asp	Gln	Glu	Ile	Pro 290	
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	-										aat Asn					1016
_			_					_		_	cag Gln					1064
			_			-	-		_		gat Asp 350	_				1112
											ctt Leu					1160
											aaa Lys					1208
											aag Lys					1256
											cct Pro					1304
											aag Lys 430					1352
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											ttt Phe					1496
											aaa Lys					1544
											gaa Glu 510					1592

	cgg Arg															1640
	aaa Lys															1688
_	gaa Glu	_		_	_		-				-					1736
	caa Gln							_				-				1784
	tac Tyr 580															1832
	tta Leu															1880
_	tgg Trp	~	_		_		_	_			_		-			1928
	aaa Lys															1976
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	tac Tyr															2168
	tgc Cys															2216
	tgt Cys	_	-				_	-								2264
	aaa Lys 740				-	_			_	_		-				2312

			aat Asn													2360
			gaa Glu													2408
			tac Tyr 790													2456
gct Ala	act Thr	ccc Pro 805	ttt Phe	aaa Lys	gaa Glu	tat Tyr	ttg Leu 810	aag Lys	cgg Arg	tta Leu	gaa Glu	gaa Glu 815	tat Tyr	tat Tyr	ttt Phe	2504
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aag Lys	act Thr	tta Leu 885	agt Ser	att Ile	gtg Val	gct Ala	agg Arg 890	gct Ala	agt Ser	tgg Trp	aat Asn	aat Asn 895	gag Glu	aaa Lys	ttt Phe	2744
			ttg Leu													2792
			ata Ile													2840
			tgc Cys													2888
			ttg Leu 950													2936
			ata Ile													2984
			tta Leu													3032

980 985 990

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	a att y Ile		Ile					Glu			taaa	atcaa	aac a	aaatt	agtca	3133
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Se	r Phe	Glu 35		Arg	Asp	Leu	Phe 40		Val	Leu	Glu	Asn 45		Val	Gln	
Ph	e Asp 50	Tyr	Glu	Lys	Lys	Pro 55	Tyr	Lys	Asp	Asp	Leu 60	Tyr	Phe	Leu	Cys	
Ьу 65	s Phe	Val	Glu	Pro	Ala 70	Leu	Lys	Ala	Ile	Phe 75	Ser	Asn	Leu	Asn	Thr 80	
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Ph	e Asp	Ala	Lys 100	Cys	Ala	Leu	Asp	Leu 105	Ala	Lys	Arg	Pro	Gly 110	Arg	Ser	
Le	u Lys	Glu 115	Lys	Leu	Cys	Asp	Asn 120	Lys	Val	Leu	Ser	Val 125	Lys	Arg	Tyr	
Va	l Asn 130	Ala	Asn	Thr	His	Glu 135	Asn	Arg	Phe	Leu	Lys 140	Arg	Phe	Ile	Lys	
	u Leu	Leu	Arg	Ile		His	Trp	Arg	Glu		Glu	Phe	Gln	Gln		
14 Ph	e Glu	Glu	Leu		150 Phe	Ser	Ile	Thr		155 Phe	Leu	Lys	Asn		160 Val	
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His Phe Asp Lys His Tyr Lys Arg Ile Phe Lys Ala His Asp Trp Leu

Tyr Asp Gly Val Gly Ser Leu Met Asn Leu Asp Gln Ile Phe Tyr Leu

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195 200

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290 295 300

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205

220

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			420					425					430	Lys	
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	450					455					460			Gln	
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			500					505					510	Val	
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	610					615					620			Pro	
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			660					665					670	Glu	
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		755					760					765		Glu Cys	
	770					775					780			Asn	
ьуs 785	тте	rue	ser	птр	790	rie C	пец	GIU	GIU	795	GIU	T 11T	ъси	ASII	800

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Asn Ala Lys Arg Glu Leu Glu Leu Ile Pro Glu Ser Glu Lys Thr Met
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Ser Lys Ile Lys Ser Leu Arg Lys Phe Glu Ser Asn Pro Leu Val Arg
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Phe Asp Pro Ser Ala Leu Ala Leu Glu Pro Lys Phe
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Asn Glu Leu Asn Thr Lys Gly Cys Ile Ala Ile Glu Asn Pro Leu Leu
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Thr Ala Pro Ile Ile Ala Leu Asp Lys Leu Ile Gly Leu Gly Lys Gly
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363 &lt;211&gt; 373 &lt;212&gt; DNA &lt;213&gt; Helicobacte: &lt;220&gt; &lt;221&gt; CDS &lt;222&gt; (103)(31) &lt;400&gt; 363 Baattctt gacacccagt taggaatg atttaagct and a graph and a gra</pre>	Ser Glu Glu Lys Gly Tyr 50	Leu Glu Glu Lys Gly Tyr Lys 50  Ser Glu Ser Asp Phe Ile Glu 70  Gly Gly Leu Ser Tyr Leu Val 85  Leu Ala Ile Lys Met Lys Thr 100  Asn Leu Thr Ser Ala Phe Ile 115  Ser Lys Ser Arg Phe Gly Ser 130  Met Ile Ala Met Ser Lys Ser 165  Ile Arg Phe Asn Ser Val Thr 180  Ala Asn Leu Lys Asp Glu Leu 195  Leu Asn Arg Leu Gly Ser Ala 210  Phe <pre></pre>	Leu Glu Glu Lys Gly Tyr Lys Ala 50 Ser Glu Ser Asp Phe Ile Glu Ala 70 Gly Gly Leu Ser Tyr Leu Val Asn 85 Leu Ala Ile Lys Met Lys Thr Glu 100 Asn Leu Thr Ser Ala Phe Ile Gly 115 Ser Lys Ser Arg Phe Gly Ser Val 130 Glu Arg Gly Asn Met Gly Gln Thr 150 Met Ile Ala Met Ser Lys Ser Phe 165 Ile Arg Phe Asn Ser Val Thr Pro 180 Ala Asn Leu Lys Asp Glu Leu Lys 195 Leu Asn Arg Leu Gly Ser Ala Lys 210 Phe <pre> </pre> <pre> &lt;210&gt; 363 &lt;211&gt; 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